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Vol. XXI, No. 2 FEBRUARY, 1932

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 80th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN TORONTO, CANADA, IN 1932—August 22nd–27th, Royal York Hotel, Headquarters, R. B. J. Stanbury, 43 Victoria St., Toronto 2, Canada, Local Secretary.

The 1932 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Toronto.

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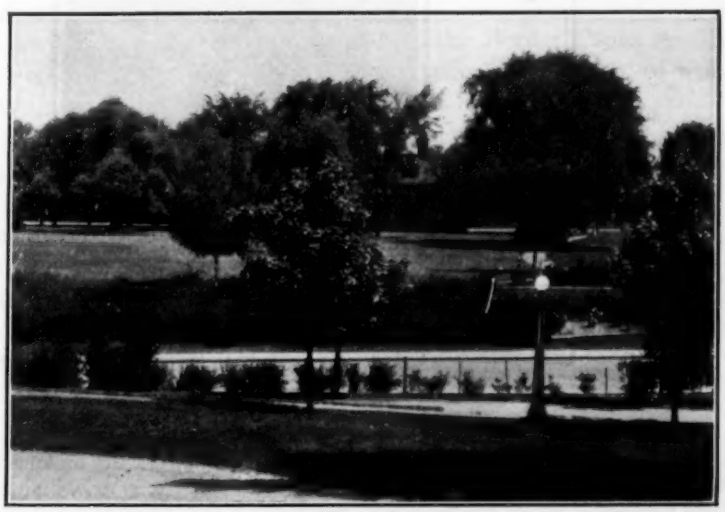
THE EIGHTIETH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Very soon it will be six months since the last annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, which signifies—that in about the same period of time which has elapsed the next meeting of the ASSOCIATION will convene in Toronto—August 22nd to 27th.

Channel between Clear and Newboro Lakes, Rideau Lakes District, Ontario.—The Rideau Lakes of Ontario, between Ottawa and Kingston are ideally suited to camping, canoeing and fishing and extremely popular among sportsmen and other vacationists.

Officers of Committees, Sections, Conferences and of other divisions are reminded that the approaching meeting in Toronto presents the opportunity of participation by our Canadian members in the programs. Papers should be solicited and abstracts requested to accompany these, so that publicity may be given.

Prospective contributors of papers should address the section officers—their names and addresses may be found in the roster of the Advertising Section, back pages.



The Driveway—Ottawa, Ontario.—A part of the extensive driveway system for which Ottawa, Canada's capital city, is noted. Following the Rideau Canal for several miles, the Driveway joins the main part of the city, in the vicinity of the Houses of Parliament.

ARTHUR J. WILKINSON.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXI FEBRUARY, 1932 No. 2

THE CHAIRMAN OF THE COUNCIL OF THE CANADIAN PHARMACEUTICAL ASSOCIATION.

Arthur J. Wilkinson was born at Fort Malden, Amherstburg, Ontario, Canada, in 1873. He graduated from the Ontario College of Pharmacy in 1894 with high honors and was awarded the College Gold Medal, and the Gold Medal for proficiency in Materia Medica.

Shortly after graduation he opened a drug store in Windsor, Ontario, where he has resided ever since; he has taken an active interest in the welfare of his native city, and was honored by election to the City Council for three successive years, when he retired undefeated.

His activities on behalf of the retail druggists of the Border Cities resulted in the development of one of the strongest local associations in Canada, of which organization Mr. Wilkinson was president for a number of years.

He is a former president of the Ontario Retail Druggists' Association, and at the 1931 convention of the Canadian Pharmaceutical Association in Winnipeg he was elected chairman of its Council, succeeding Dean G. A. Burbidge, who was elected president of the Association.

Mr. Wilkinson is heart and soul in Association work, to which he devotes a great deal of his time. He is keenly interested in the effort to do away with the unfair practices of predatory price cutting, and in every movement tending to improve and elevate the professional status of pharmacy.—R. B. J. S.

"Courageous discipline among professional men is the working partner of education in truth. Without it, all educative efforts will presently fail through having invited public attention to shortcomings that should be held to a minimum. Loss of faith in our profession would be calamity for our public because there is no adequate substitute. In adaptiveness, then, lies the art of being ourselves for this most rapidly moving era. Adaptiveness is the ability to recognize and conform to situations as they are. It is a proof of fitness. If we are fit we will employ adequate professional cohesiveness as one of our tenets of truth"—DR W D. CHAPMAN.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

PROFESSIONS ENGAGE IN SELF-EXAMINATION.

DR. RAY LYMAN WILBUR, the Secretary of the Interior, pointed out in an address at the fiftieth aniversary dinner of the New York Post-Graduate Medical School and Hospital that within three decades American medicine has been made over.—"The laboratory has won its way into every department of the medical school as well as the hospital. Empiricism has largely succumbed to the scientific method. The doctor's growth must be alongside of that of his profession. The doctor who does not read the current medical journals, follow the activities of the various medical scoieties and attend occasional clinics is not a good public servant."

He contended that "in the United States we have not provided such opportunities for keeping the doctor up-to-date as might be expected with all our wealth and our manifold medical interests. We have been concentrating for the last quarter of a century on the better training of men seeking the degree of Doctor of Medicine. The amalgamation of the medical schools with the universities and the installation of the scientist into the medical school has consumed most of our energy. Bringing the hospital into the medical school and conducting it upon an educational basis has also reacted largely to the benefit of the undergraduate medical student. The interne year has brought into the hospital a large body of keen, active-minded young men who are enlarging their experience under the best of clinical leadership. Each year we have ripened a group of graduates better trained fundamentally in medicine, but still green in the great game of the care of the sick."

"There has been some attempt," he said, "to give clinical experience and training to the physicians alongside of the young men who were in the cub-stage of medicine. We have had too few institutions concerned with offering adequate opportunities to the physician himself. There have been a certain number of doctors who received more or less training in the specialties but we have not had in this country graduate Medical centers comparable to those of some of the capitals of Europe."

Justice Philip J. McCook, of the New York Supreme Court, has stated that to improve materially the standards of the legal profession not only must membership therein be more jealously guarded, but the condition of legal education must be so revised as to arouse in the members of the bar higher idealism and a greater sense of public responsibility.

Dean Young B. Smith, of Columbia University Law School, said that it would be a step forward if all the schools in a particular locality would agree upon some minimum standard of fitness and refuse admission to all applicants who did not measure up to such a standard. It would seem there is no surer way of inculcating into prospective members of the bar a sense of public responsibility than by so organizing legal education as to reveal the function of law in society and the social implications of legal rules and legal practices, in addition to acquainting the students with laws of technique.

Leonard A. Seltzer, writing in the *American Journal of Pharmacy*, stated that "there are, of course, and always will be in both professions persons who will ignore

their responsibilities. On the other hand, the leaders in the professions of medicine and of pharmacy recognize the great significance from the standpoint of breadth, of scope, and vital interest of the relationship of pharmacy and medicine. They recognize also how much greater and more vital is the benefit to themselves and to the public if a cordial coöperation between the two professions exists, and the importance of working for the advancement of such coöperation."

The prescription interlocks the efforts of physicians and pharmacists; it is written after careful diagnosis by the physician; the pharmacist has been trained in the fundamentals of drug knowledge, essentials of dispensing and compounding—the best forms of administration. If the patient treats the prescription indifferently, it signifies his lack of faith in the physician or in the pharmacist; it requires the coöperative efforts of both professions to correct these conditions if they exist, and it is to the interest of both professions and public health standards that professional faith and confidence be in evidence; loss of faith invites calamity. Dr. W. D. Chapman, writing in the *Illinois Medical Journal*, said "A better-educated public assuredly demands a better-behaved profession."

RENDERING FIRST AID.

DIFFERENT viewpoints obtain relative to the rendering of first aid; in fact, the pharmacist often feels that it is safer for a layman to render "first aid" than it is for a pharmacist, and this viewpoint is largely responsible to a number of occurrences which have resulted either in inconvenience or financial worry. "First Aid Service" is explained and taught in various educational institutions, in clubs, to boy and girl scouts, and to a large extent in the hospitals or active service of the military and naval divisions.

In the January number of the *American Journal of Pharmacy* there are two articles which present two different viewpoints, one by Dr. H. C. Wood, Jr., and the other by Dr. F. B. Kilmer, who advocated as little practice of "first aid" as possible by the pharmacist. Dr. Wood agrees with Dr. Kilmer that much harm has been done by well-meaning medical efforts, by persons who do not understand, but he insists that this is argument for more, rather than less, education of the pharmacist in the means to be employed for first aid. He states that he teaches his students it is of great importance to know what to do, but at the same time he believes he is justified in teaching pharmacy students how to do certain tasks which in his opinion they in later years may be called upon to perform.

There is no question but that anyone who sees an accident, and whose judgment tells him that he is competent to help the injured, will render possible aid. In our opinion, Dr. Wood is correct when he says that the students should be taught what not to do and what to do in case of accidents, so as to be of assistance to one who has sustained an injury.

The question has been discussed a number of times in these columns, and in a recent communication to a British pharmaceutical publication a correspondent states "it seems to be rather surprising that 'first aid' has not been included in the curriculum for students." The correspondent refers to his experiences, largely obtained in a doctor's office, where cases of accident were of frequent occurrence; he also relates an occasion when he had the opportunity and did save the life of an

individual who otherwise would have died from hemorrhage. The Editor comments that branches of the St. John Ambulance Society hold classes in nearly all the public centers of Europe and Great Britain, and many of the pharmacists attend these classes and are qualified to give first aid treatment. The Editor comments further by saying that there are, however, legal as well as professional reasons that limit the nature and scope of first-aid treatment that can be given by pharmacists.

The New York Branch, A. PH. A., discussed several papers on "First Aid" during its December meeting and they are referred to in connection with this comment—see page 80. It would seem that here is a subject that may well receive further consideration by physicians, hospitals, medical colleges, colleges of pharmacy and other organizations.

DEVELOPMENT OF PURE FOOD LAWS AND ORIGIN OF PROPOSAL AND LEGISLATIVE ADOPTION.

HENRY S. MANLEY, Counsel Department of Agriculture and Markets, State of New York, recently discussed "Pure Food Legislation." (*U. S. Daily* for February 3, 1932.) He makes a statement that "the modern movement for pure food legislation in the United States originated with some citizens of New York about 1879, and bore early fruit in a New York statute of 1881, upon a pattern which has been followed in the Federal Act and in nearly all other modern pure food legislation." In 1879 Dr. Edward R. Squibb read a paper before the New York Medical Society on "A Proposed Law to Prevent the Adulteration of Foods and Medicines and to Create a State Board of Health."

The outstanding work of Dr. Squibb is well and favorably known to the members of the AMERICAN PHARMACEUTICAL ASSOCIATION, because during many years he was an active worker among them. The purpose of this comment, however, is to call attention to the interesting and instructive article by Dr. L. F. Kebler[1] on "George Thorndike Angell, the Fearless Pioneer for Pure Foods and Drugs." Due reference is made to the work of Dr. Squibb in this legislation and the clause which aided in bringing about the legislation regulating the manufacture of foods.

In a prior article Dr. Kebler[1] discusses the work of three pioneers in initiating federal pure food and drug legislation; they are: Hon. H. B. Wright, of Pennsylvania; Gen. R. L. T. Beale, of Virginia; and Col. H. Casey Young, of Tennessee. It may be stated here that one of the reasons for the organization of the AMERICAN PHARMACEUTICAL ASSOCIATION was the desire of pharmacists to improve the provisions under which drugs and chemicals were imported. Quite a time before 1848, the United States Pharmacopœia had appeared (1820) and the interest shown in the standards for foods and drugs was evidenced by the publications and writing of that period.

Frederick Accum's treatise on "Adulteration of Foods" appeared about the same time as the first edition of the Pharmacopœia. In 1823, James Cutbush, pharmacist and physician, published his lectures on food adulteration, and shortly before the enactment of the law of 1848 Lewis C. Beck's book, entitled "Adulteration of Various Substances Used in Medicine and the Arts," appeared. The first

[1] JOUR. A. PH. A., 19 (1930), 591, 753.

general pure food bill was introduced on January 20, 1879. This was known as the Wright Bill, but no final action was taken relative to its enactment.

In 1881 a commission of three persons was appointed to investigate and report on the adulteration of foods and other articles. This commission made an exhaustive report and, gradually, led the way to the Federal Pure Food and Drugs Act. The American Medical Association is providing standards for foods, and thought may be given by pharmacists to supply such standardized foods for invalids and the sick-room.

CHEMISTS AND CHEMISTS.

THE CHEMIST for January, under above caption, in an editorial states that "one conclusion which can be reached from the discussion of the professional status of chemists is that chemistry is a profession whose field can be definitely limited. All bricklayers lay bricks. Some lay more or lay them better than others. Practically all physicians deal with the care of the human body, although some are chemists and a few are speculative builders and real estate operators. Many chemists have nothing specific to do with chemicals or materials. Chemists are not only research men and analysts, but also patent lawyers, designing engineers, and plant executives. We no longer say that a man is not a chemist because he has graduated from the laboratory to some form of executive work. If we did a sizable percentage of our members would have to give up their fellowship in the Institute.

"To what does this all lead us? Simply to a realization that the problem is much more complex than the case of the lawyer or physician or other professional group. It will not be so twenty years after there is a definite licensing plan for all chemists. Within that time chemistry will have provided boundaries for itself.

"Haven't you met some one to whom you were introduced as a chemist, who immediately said: 'Oh, yes, I want to ask you a question—Is tincture of ipecac good for colic?'

"With all the varieties of chemists in mind can we expect homogeneity or solidarity without some special effort?"

Wonder if the editor of *The Chemist* has ever thought of the pharmacist?—Scheele certainly was a pharmacist throughout his short life, but chemists claim him; seldom do they mention the fact that he was a pharmacist. He declined a place on a faculty, fearful that he would neglect the work in his apotheke. Sertürner was a pharmacist; his pharmacy is still standing and is still a pharmacy. A monument to Caventou and Pelletier designates them as two French pharmacists who discovered quinine but, usually, they are spoken of as chemists, and so we could go through a very long list of noted pharmacists. We hope *The Chemist* will always credit pharmacy with its achievements and not overlook those who honored this profession, and we wish the publication success in holding chemists within its professional fold.

A pharmacist does not necessarily cease to be a pharmacist when he makes important discoveries in chemistry, as shown by the examples given.

"Unless we act wisely and with courage among ourselves and speak with one voice among the family of organizations, our own educative efforts may be expected to presently lead intelligent people to resent in us futilities which they do not understand."—DR. W. D. CHAPMAN.

SCIENTIFIC SECTION

INFLUENCE OF THE ALKALOIDAL PURIFICATION PROCEDURE IN ASSAY OF ALKALOIDAL DRUGS.

BY GEORGE E. ÉWE.

In assaying certain alkaloidal drugs and their preparations the initial immiscible solvent extract containing the alkaloids is often so light-colored as to appear free from substances likely to interfere with titration of the alkaloids. This is especially true when a fluid preparation has been dried on saw-dust prior to extraction with ammoniacal, immiscible solvent. Such a light-colored extract may tempt the operator to resort to what we will term the "short" procedure of merely evaporating the extract directly for the titration, in an effort to avoid the time-consuming "complete" alkaloidal purification procedure as typified by the U. S. P. method outlined on pages 452, 453 and 454 of the U. S. P. X.

While the results so obtained by this "short" procedure often check well with the results obtained by the "complete" purification procedure this practice fails to yield correct results often enough to condemn it for practical use as shown by the following table of results by the 2 methods:

Drug Product.	"Complete" Procedure. Per Cent.	"Short" Procedure. Per Cent.
Aconite Root 1	0.488	1.24
Aconite Root 2	0.551	0.632
Ignatia Bean 1	3.097	3.203
Ignatia Bean 2	2.907	3.006
Ignatia Bean 3	2.657	2.631
Ignatia Bean 4	3.08	3.29
Ipecac 1	1.58	1.58
Ipecac 2	2.04	2.06
Ipecac 3	2.34	2.32
Ipecac 4	2.50	2.43
Ipecac 5	2.462	2.496
Ipecac 6	2.11	2.23
Ipecac 7	2.15	2.25
Fldext. Ipecac 1	1.38	1.36
Nux Vomica 1	2.77	4.02
Nux Vomica 2	2.67	3.78
Nux Vomica 3	2.68	2.57
Nux Vomica 4	2.80	2.80
Nux Vomica 5	2.76	2.94
Nux Vomica 6	2.44	2.84
Tinct. Nux Vomica 1	0.0943	0.0996
Tinct. Nux Vomica 2	0.305	0.305
Tinct. Nux Vomica 3	0.1974	0.1970
S. E. Nux Vomica 1	12.2	12.7
S. E. Nux Vomica 2	14.37	18.2
S. E. Nux Vomica 3	12.5	12.24
P. E. Nux Vomica 1	16.85	17.29
P. E. Nux Vomica 2	20.5	21.6
F. E. Nux Vomica 1	1.918	1.85

F. E. Nux Vomica 2	1.97	1.893
F. E. Nux Vomica 3	1.80	1.80
F. E. Nux Vomica 4	2.32	2.28

A powdered extract of Nux Vomica which assayed 16.2% total alkaloids by the U. S. P. ("complete") procedure gave a result of 24.9% when the initial chloroformic extracts were evaporated directly and the alkaloidal residue then titrated. The alkaloidal residue contained magnesium which was evidently present as a chloroform-soluble magnesium "soap" in the powdered extract. This type of contamination of alkaloidal residues by "soaps" of the "earthy" elements was pointed out by Watkins and Palkin (*J. A. O. A. C.*, Vol. X, No. 1 (Feb. 15, 1927)). It is likely that the divergences often shown by incomplete or "short" alkaloidal purification procedures are caused by the inclusion of these titratable "earthy soaps" in the alkaloidal residue. Another possible contaminant of alkaloidal residues obtained by incomplete purification procedures is that represented by ammonium salts extracted along with the alkaloid as shown by the results reported by the writer in JOUR. A. PH. A., 19 (1930), 26–27.

Thus it is evident that alkaloidal residues obtained by these incomplete alkaloidal purification procedures may be contaminated by "earthy soaps" and ammonium compounds. Both of these contaminants show titration value and consequently these "short" procedures sometimes give results which are too high. This is shown by the above comparative results by the 2 methods.

In an article in the JOUR. A. PH. A., 18 (1929), 241, the writer has shown that the ammoniacal chloroformic extractives of various vegetable drugs have decided basic effect. This basic effect is often due to the presence of calcium and magnesium compounds and also sometimes to the presence of ammonium compounds. When sodium bicarbonate is used in place of ammonia in making the chloroformic extractions basic effect is also shown by the extractives but the basicity, while certain, is of much less magnitude than that yielded by ammonia, and is, in fact, relatively negligible.

Drug.	Gentian.	Podophyllum.	Capsicum.	Cannabis.	P.E. Jalap.
Amount of drug.....	0.66 Gm.	0.33 Gm.	(See note)	0.66 Gm.	0.33 Gm.
Basic effect using ammonia....	0.00735	0.00641	0.0238	0.0191	0.00641
Basic effect using sodium bicarbonate	0.000267	0.000869	0.00267	0.00367	0.00214

NOTES: No record was kept of the amount of capsicum used, the extracts having a light amber color. Basic effects are stated in the table in terms of Gms. of strychnine alkaloid for convenience in comparison.

The weaker basicity yielded by sodium bicarbonate may be due partly to the absence of ammonium compounds in the extracts and partly to the breaking up of the organic compounds of calcium and magnesium by the sodium bicarbonate whereby they are rendered insoluble in chloroform. This action of sodium bicarbonate appeared to offer promise in the assay of alkaloidal drugs by the incomplete purification method but the following experiments show that this apparently useful action of sodium bicarbonate is offset by its lower efficiency in liberating alkaloids from plant tissues:

Drug.	Extraction Method.	Alkaloidal Purification Process.	Assay: Per Cent.
Ipecac No. 6	Ether-Ammonia	Extracts evaporated directly and titrated	2.23
	Ether-Sod. Bicarb.-Water	Extracts evaporated directly and titrated	1.97
	U. S. P.	U. S. P.	2.11
Ipecac No. 7	Ether-Ammonia	Extracts evaporated directly and titrated	2.25
	Ether-Sod. Bicarb.-Water	Extracts evaporated directly and titrated	1.90
	U. S. P.	U. S. P.	2.15
Nux Vomica No. 5	Ether-Chloroform-Ammonia	Extracts evaporated directly and titrated	2.94
	Ether-Chloroform-Sod. Bicarb.-Water	Extracts evaporated directly and titrated	2.34
	U. S. P.	U. S. P.	2.76

Thus it will be noted that whereas the use of sodium bicarbonate resulted in lower yields of alkaloids this decrease was not entirely due to elimination of titratable "earthy soaps" and ammonium compounds from the alkaloidal residues, but was partly due to incomplete liberation of the alkaloids since the U. S. P. purification process which practically entirely eliminates these interfering substances yielded higher results than incomplete or "short" procedures in which sodium bicarbonate was used.

Sodium carbonate, like sodium bicarbonate, also proved less effective than ammonia in liberating alkaloids from vegetable tissue and consequently is inadmissible for the purpose of obviating the necessity for the use of ammonia followed by "complete" purification procedure:

Drug.	Extraction Method.	Alkaloidal Purification Process.	Assay: Per Cent.
Ipecac No. 6	Ether-Ammonia	Extracts evaporated directly and titrated	2.23
	Ether-Sod. Carb.-Water	Extracts evaporated directly and titrated	1.56
	U. S. P.	U. S. P.	2.11
Ipecac No. 7	Ether-Ammonia	Extracts evaporated directly and titrated	2.25
	Ether-Sod. Carb.-Water	Extracts evaporated directly and titrated	1.43
	U. S. P.	U. S. P.	2.15
Ignatia No. 4	Chloroform-Ammonia	Extracts evaporated directly and titrated	3.29
	Chloroform-Sodium Carbonate-Water	Extracts evaporated directly and titrated	2.70
	Chloroform-Ammonia-	Complete purification procedure	3.08
Nux Vomica No. 5	Chloroform-Ammonia-Ether	Extracts evaporated directly and titrated	2.94
	Chloroform-Sodium Carbonate-Water	Extracts evaporated directly and titrated	2.33
	U. S. P.	U. S. P.	2.76
Nux Vomica No. 6	Chloroform-Ammonia-Ether	Extracts evaporated directly and titrated	2.84
	Chloroform-Sodium Carbonate-Water	Extracts evaporated directly and titrated	2.36
	U. S. P.	U. S. P.	2.44

Alkaloidal residues whether obtained by evaporation of the initial immiscible solvent extracts ("short" procedure) or by the U. S. P. purification process ("complete" procedure) invariably show the presence of calcium, and often, magnesium upon analysis. Alkaloidal residues obtained by the U. S. P. procedure always show very much less of these "earthy" compounds than do the residues obtained by the "short" procedure.

Immiscible solvent solutions of alkaloidal residues from numerous single assays of Belladonna, Ipecac, Ignatia and Nux Vomica when evaporated to dryness, ignited, dissolved in a few drops of hydrochloric acid, made alkaline with ammonia, then acid with acetic acid and treated with ammonium oxalate yielded decided reactions for calcium ranging from turbidities to small precipitates. When the calcium oxalate was completely precipitated with ammonium oxalate and ammonia by allowing to stand over night, filtered off and sodium phosphate and ammonia was added to the filtrate distinct traces of crystalline precipitate were obtained in the case of Ipecac and Nux Vomica thus indicating the presence of magnesium. Blanks were conducted in all cases with negative results. To make certain of the identity of the calcium oxalate the precipitates from a large number of alkaloidal residues were consolidated and confirmatory tests made. To ascertain the possible influence of the "earthy" compound content of alkaloidal residues purified by the U. S. P. procedure upon analytical results a large series of immiscible solvent solutions of alkaloidal residues each representing single assays of Belladonna, Ipecac and Nux Vomica were individually evaporated, and the residues then ignited to constant weight. In every case, quite evident white stains remained unvolatilized but the quantity was "unweighable" (less than 0.5 mgm.), so that it is likely that the influence of these "earthy" compounds is negligible. A corresponding series of quantitative tests made on initial immiscible solvent extracts of alkaloidal drugs obtained by the "short" procedure showed as much as 0.0030 Gm. of residue upon ignition from single assays of Aconite Root; 0.0011 Gm. from Ipecac and 0.0023 Gm. from Nux Vomica. Ignatia showed less than 0.5 mgm. residue upon ignition in this test although obviously more than when the alkaloids were purified by the "complete" procedure.

SUMMARY.

Incomplete alkaloid purification in the assay of alkaloidal drugs may cause inaccurate results due to inclusion in the alkaloidal residue of titratable calcium, magnesium and ammonium compounds.

Sodium carbonate or bicarbonate cannot be used to replace ammonia in an effort to eliminate the above-mentioned interfering substances as their possible usefulness in this direction is offset by their low efficiency in liberating alkaloids from plant tissues.

The U. S. P. alkaloidal purification process ("complete" procedure) essentially eliminates these interfering substances but even residues so purified may still retain traces of calcium and magnesium, although the proportion is not significant for ordinary assay purposes.

RESEARCH LABORATORIES,
TAILBY-NASON COMPANY,
BOSTON, MASS.

"When one is misguided to make extravagant claims or to disparage earnest workers or to sell or loan a respected professional name for advertising purposes, our public is puzzled or exploited or both and harm accrues to both the profession and the public. When we have educated our public sufficiently, they will know their right to look to us for protection in these matters and they may be expected to impose a proper suffering upon the profession if it fails in that."—W. D. CHAPMAN, M.D., in *Illinois Medical Journal.*

MECHANISM OF THE STABILIZATION OF ETHER BY COPPER.

BY F. W. NITARDY AND E. C. BILLHEIMER.

The value of copper in preventing the formation of peroxides in anæsthetic ether has previously been reported from this Laboratory.[1]

It has been shown that a tin container, coated on the inside with copper, is the most effective of all types of containers investigated for the preservation of anæsthetic ether in its original state of purity. This investigation included containers of various types used by domestic and foreign manufacturers of ether, such as ordinary tin cans, and bottles made of glass of various types and degrees of transparency to light, wrapped and sealed with various materials designed to protect the ether from deterioration. It was found that peroxide-free anæsthetic ether packaged in containers of this type almost invariably developed peroxides after varying storage periods, but that the same ether packaged in copper-lined tin cans, even though kept at elevated temperatures over long periods of time, remained free from peroxides or other decomposition products for an indefinite period.

Originally it was assumed that this protective action of copper was inhibitive in nature and that the copper exerted a negative catalytic effect upon the reaction by which peroxides are normally produced in ether, thus preventing their formation. However, additional research work has shown that metallic copper removes the agents causing oxidation, thus preserving ether in its original pure state, and that this reaction forms cuprous oxide, which in turn is capable of decomposing and removing peroxides from ether which may contain them. It was further shown that the formation of ether peroxides represents an oxidation reaction between ether and atmospheric oxygen and that this oxidation reaction appears to proceed in at least two distinct steps, one the combination of atmospheric oxygen with ether to produce a compound which is not disclosed by the U. S. P. peroxide test, and the other, an oxidation of this intermediate substance, either through further reaction with atmospheric oxygen or by auto-oxidation, to the final product, the ether peroxide.

The existence of the intermediate oxidation product is supported by the following experimental facts. It is possible to remove atmospheric oxygen from ether by distillation of ether. Ether peroxides, by which are meant the final oxidation products, are not volatile at the temperature at which ether distils. If anæsthetic ether is distilled in the absence of oxygen so as to remove all oxygen present therein with the first portion of the distillate, and if a further portion of the distillate is then collected under anæric conditions and this ether packaged in the absence of air in either glass or ordinary tin containers, peroxides will develop after a certain storage period. Theoretically, all the oxygen has been removed and the ether has been collected and stored under conditions which prevent recontamination, and any traces of ether peroxides which may have been originally present in quantities not detectible are left in the residue. The packaged ether should therefore contain no peroxides or oxygen which might cause development of peroxides, and should be completely stable upon storage. The only apparent explanation for the instability of this ether is the assumption of the existence of an intermediate

[1] Nitardy and Tapley, Jour. A. Ph. A., 17 (1928), 966–968.

oxidation product which is not detectible by the U. S. P. test, being not a true peroxide, and although being sufficiently volatile to distil off with the ether, is not volatile enough to be removed with the first distillate containing oxygen.

It has also been shown that pure metallic copper reacts more readily with atmospheric oxygen than does ether. If a strip of copper is cleaned chemically until by suitable test it is found free from cuprous oxide, and then exposed to air for only a few seconds, a film of cuprous oxide sufficient to be detectible by chemical test will be formed on its surface, demonstrating the speed with which metallic copper can be oxidized by atmospheric oxygen. We have further found that ether peroxides and apparently also the substance which has been termed the intermediate compound, are unstable in the presence of cuprous oxide and that the latter will remove these compounds from ether. If the ether originally contains a small amount of peroxides, their decomposition by cuprous oxide results in the formation of an organic acid, probably acetic acid, which increases the acidity of the ether. If the original ether, however, is entirely peroxide-free, the ether is preserved entirely free of impurities for an indefinite period of time when packaged in contact with copper.

It, therefore, appears that the mechanism by which copper preserves and protects peroxide-free anæsthetic ether consists of a reaction between any atmospheric oxygen which may be present in the sealed can, and the copper surface, forming a coating of cuprous oxide. The elimination of this oxidizing agent in this manner prevents the oxidation of the ether to peroxides and other oxidation impurities, so that ether stored in contact with copper remains entirely free from impurities as long as the can is sealed so that a further supply of atmospheric oxygen is not available.

CONCLUSIONS.

1. Ether peroxides are formed by oxidation of the ether by atmospheric oxygen, resulting first in an intermediate compound which is then further oxidized to the true ether peroxide, either by further reaction with atmospheric oxygen or by auto-oxidation.

2. This intermediate oxidation product, which has not been identified, appears to distil with ether, but does not appear to be a true peroxide as it does not respond to the U. S. P. test.

3. Contact of ether containing atmospheric oxygen or intermediate oxidation products with a copper surface in sealed containers results in the removal of these substances from the ether.

4. Ether, originally containing a small amount of ether peroxide, when stored in any sealed container, will eventually become free from peroxides and simultaneously traces of acids develop, probably acetic acid, due to decomposition of peroxides. If stored in a copper container this change is accelerated.

5. Ether, originally free from peroxides, when stored in contact with copper is not subject to oxidation and is maintained in its original state of purity for an indefinite period. Any oxygen that may be dissolved in the ether or present in the can disappears during storage, being removed by combination with the copper.

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THE EFFECT OF VARIOUS IODIDES UPON THE STABILITY OF HYDRIODIC ACID.*,**

BY WILLIAM J. HUSA*** AND PAUL STANLY SHATTUCK.

INTRODUCTION.

In a study of the stability of Solution of Arsenous and Mercuric Iodide, Husa and Enz (1), (2) found that in order to stabilize this solution it was necessary to prevent oxidation of the hydriodic acid formed by hydrolysis of the arsenous iodide. Several methods of improving the stability were found (1), (3), but the problem was complicated by the presence of the compounds of mercury and arsenic. It appeared, therefore, that it would be advantageous to make a study of solutions of pure hydriodic acid and that the results of such a study could later be applied to the Solution of Arsenous and Mercuric Iodide.

Since hydriodic acid as such is also used as a pharmaceutical, a further knowledge of its stability under various conditions would be of interest. In a report of the Committee on Actinic Values of Glass (4), Dr. W. L. Scoville suggested that a study be made of the effect of light upon Diluted Hydriodic Acid, U. S. P. X. Dr. Scoville also pointed out (5) that previous studies of hydriodic acid have been made chiefly on solutions protected by hypophosphorous acid, syrup or glycerin and that aside from this little or nothing is known about the effect of light and temperature. Likewise Kistiakowsky (6) has pointed out that little systematic investigation has been carried out on the influence of ions on the rate of oxidation of hydriodic acid.

The purpose of the present investigation was to make a study of some of the factors which might affect the stability of hydriodic and to determine the effect of various iodides on the rate of decomposition.

DECOMPOSITION OF HYDRIODIC ACID.

It is a well-known fact that solutions of hydrogen iodide turn brown after a time, due to liberation of free iodine. The hydriodic acid is oxidized by oxygen of the air in the following manner:

$$4HI + O_2 \longrightarrow 2H_2O + 2I_2 .$$

Solutions of hydriodic acid also appear to undergo decomposition into hydrogen and iodine as follows (7), (1):

$$2HI \longrightarrow H_2 + I_2.$$

PREPARATION OF THE HYDRIODIC ACID.

Among the methods which have been used for the preparation of hydriodic acid are the following: (*a*) direct union of hydrogen and iodine, (*b*) reaction of tartaric acid and potassium iodide, (*c*) hydrolysis of phosphorous tri-iodide, (*d*) action of iodine upon certain organic compounds such as copaiba, rosin, pinene, etc., and (*e*) action of hydrogen sulphide upon iodine.

In this investigation, the hydriodic acid was prepared by the action of hy-

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drogen sulphide upon iodine in aqueous solution. The product was purified by distillation under reduced pressure.

The hydrogen sulphide was prepared by the action of diluted sulphuric acid upon ferrous sulphide in a Kipp generator. The gas was passed through a solution of barium hydroxide to remove impurities (8).

Reaction of H_2S and I_2 (9).—H_2S was passed into a tall cylindrical bottle containing 3 Gm. of powdered iodine and 250 cc. of water. After this iodine was converted to HI, 20 Gm. more of iodine were added, a little at a time. Later 30 Gm. more of iodine were added and after this had been completely converted into HI the current of H_2S was stopped. The sulphur which had precipitated during the reaction was removed by filtration through glass wool and the dissolved H_2S was removed by bubbling hydrogen through the solution.

Distillation of the Hydriodic Acid.—The hydriodic acid was distilled at a pressure of about 8 mm. of mercury in an atmosphere of hydrogen. Since the acid was very prone to decomposition after removal of the H_2S, several precautions were taken, such as the use of ice water in the condenser, and uniform heating of the distilling flask by immersion in hot water. The product was collected in a Bogert receiver.

The acid made in this manner was water white and gave no color with starch T.S.; with $AgNO_3$ T.S. there were no indications of the presence of sulphides.

EXPERIMENTAL DATA.

The Effect of Various Conditions of Light and Temperature upon the Decomposition of N/2 Hydriodic Acid.—Ten cc. of *N*/2 HI were placed in each of sixteen glass-stoppered pyrex bottles of 150 cc. capacity, thus allowing for an ample supply of air. Four of the bottles were placed upon the roof in sunlight, four in the laboratory in diffused light, four in a dark locker, and four in a refrigerator in the dark. One bottle from each place was titrated with *N*/500 sodium thiosulphate solution at the end of one, two, four and seven days, using freshly prepared starch T.S. as indicator. The results were as follows:

TABLE I.

	Percentage Decomposition after			
	1 day.	2 days.	4 days.	7 days.
Sunlight	13.8	21.6	23.8	35.4
Diffused light	2.6	3.5	7.4	10.8
Dark (room temp.)	0.3	0.6	2.2	2.9
Dark (in refrigerator)	0.2	0.3	0.5	0.9

The rate of decomposition of hydriodic acid is thus accelerated by light and by increase in temperature.

Stability of Various Concentrations of HI in Diffused Light and Sunlight.—The results with 10-cc. portions of acid of various concentrations in 150-cc. bottles placed in diffused light at room temperature were as follows.

TABLE II.

	Percentage Decomposition after			
Normality of HI.	1 day.	2 days.	4 days.	7 days.
N/2	0.8	1.2	3.0	4.0
N/10	0.2	0.5	1.7	2.4
N/100	0.0	0.0	0.0	0.0
N/1000	0.0	0.0	0.0	0.0

This experiment shows that there is a relation between the concentration of the acid and the rate of decomposition. Solutions of a concentration of $N/100$ or less showed no free iodine after seven days, while more concentrated solutions showed appreciable decomposition.

A similar experiment was performed with bottles placed on the roof in sunlight.

TABLE III.

Normality of HI.	Percentage Decomposition after 1 day.	2 days.	4 days.	7 days.
$N/2$	18.1	20.5	34.3	47.0
$N/10$	4.8	6.0	19.6	28.1
$N/100$	0.5	0.6	2.1	17.0
$N/1000$	0.1	0.2	0.3	0.3

The decomposition of hydriodic acid in sunlight was more rapid as the concentration increased.

Choice of Concentration.—The acid used in experiments up to this point was of various concentrations ranging from $N/2$ to $N/1000$. The concentration that was finally selected for further experimental work was $N/10$, as this gave an appreciable amount of decomposition in a reasonable time and corresponded to the approximate concentration of U. S. P. X Diluted Hydriodic Acid.

Effect of Potassium Iodide.—The effect of various concentrations of potassium iodide on the rate of decomposition of $N/10$ hydriodic acid was determined. Ten-cc. portions in 150-cc. pyrex bottles were placed in diffused light. The results were as follows:

TABLE IV.

Iodide Present in Addition to $N/10$ HI.	Percentage Decomposition after 1 day.	2 days.	4 days.	7 days.
Blank (acid alone)	0.1	0.2	0.4	0.8
$M/1000$ KI	0.1	0.2	0.4	0.1
$M/100$ KI	0.1	0.2	0.5	0.8
$M/10$	0.2	0.2	0.5	0.8
$M/2$ KI	1.2	1.6	3.2	5.9

$M/2$ solutions of potassium iodide had an accelerating influence upon the decomposition of hydriodic acid, but lower concentrations apparently had no effect.

Effect of Iodides in Absence of Light.—In the experiments carried out in sunlight and diffused light at the temperature of the surrounding atmosphere it was found impossible to duplicate the exact numerical results. The variations were greatest in the experiments in sunlight where the variations in temperature and intensity of light were greatest. It seemed desirable to select conditions of light and temperature that could be duplicated at any time. Since natural light is always variable, it was decided to carry out the experiments in absence of light. This was accomplished by painting the outside of the pyrex bottles with a heavy coating of black asphalt paint. To avoid variations in temperature the bottles were placed in a Freas large size thermostat at 30° C.

A number of experiments were carried out to determine the effect of the iodides of potassium, cadmium, zinc, lithium, ammonium, manganese, strontium, sodium, calcium, barium, magnesium and ferrous iron upon the decomposition of hydriodic acid. The solutions were made tenth-normal in respect to hydriodic acid. The salts were present in concentrations of $M/2$, $M/10$, $M/100$ and $M/1000$.

One bottle of each concentration was titrated with $N/500$ sodium thiosulphate to determine the free iodine at the end of one day, two days, four days and seven days. The decomposition was calculated in per cent of free iodine as compared with the total iodine present as hydriodic acid. The results of an experiment with ferrous iodide were as follows:

TABLE V.

Iodide Present in Addition to $N/10$ HI.	Percentage Decomposition after 1 day.	2 days.	4 days.	7 days.
Blank (acid alone)	0.2	0.7	1.4	3.2
$M/1000$ FeI_2	0.3	0.7	1.5	2.7
$M/100$ FeI_2	1.3	1.5	3.2	5.7
$M/10$ FeI_2	6.1	8.0	10.5	18.1
$M/2$ FeI_2	18.4	21.4	31.9	56.3

Ferrous iodide has an accelerating influence upon the decomposition of hydriodic acid which increases with increasing concentration of the ferrous iodide. The results with the other iodides will be discussed below.

Another series of experiments was carried out under the same conditions upon solutions of the salts alone, to see how much the iodides themselves decomposed in absence of added hydriodic acid. The decomposition of solutions of ferrous iodide was as follows:

TABLE VI.

Concentration of Ferrous Iodide.	Percentage Decomposition as Shown by the Amount of Free Iodine after 1 day.	2 days.	4 days.	7 days.
$M/1000$	0.00	0.00	0.00	0.00
$M/100$	0.00	0.00	0.00	0.00
$M/10$	0.00	0.02	0.26	0.33
$M/2$	1.18	1.26	2.26	2.77

In concentrations of $M/1000$ and $M/100$, ferrous iodide showed no decomposition in seven days. In concentrations of $M/10$ and $M/2$ there was some decomposition, but this was small as compared with the amount of free iodine liberated from a mixture of ferrous iodide and hydriodic acid.

A similar test was made with manganese iodide solutions.

TABLE VII.

Concentration of Manganese Iodide.	Percentage Decomposition as Shown by the Amount of Free Iodine after 1 day.	2 days.	4 days.	7 days.
$M/1000$	0.00	0.00	0.00	0.00
$M/100$	0.00	0.00	0.00	0.00
$M/10$	0.00	0.00	0.00	0.00
$M/2$	0.06	0.18	0.69	0.96

Manganese iodide in $M/2$ solution showed some decomposition but in lower concentrations yielded no free iodine in seven days.

Each of the other iodides previously mentioned was tested in exactly the same manner as the ferrous iodide and manganese iodide. However, none of these other iodides showed any decomposition whatsoever in concentrations of $M/1000$, $M/100$, $M/10$ and $M/2$ within seven days.

Even with the careful control of light and temperature, there was still a variation in numerical data on repetition of the same experiments with hydriodic acid at different times. This appeared to be due to slight differences in the stability

of the hydriodic acid prepared at different times. Such a condition is frequently encountered in work on highly unstable substances. However, there was no difficulty in duplicating the general results.

Under these conditions, it was thought desirable to get an exact comparison of the effect of the various iodides by comparing them directly in the same experiment. Thus an experiment was conducted in which the effect of the whole series of iodides in $M/2$ concentration after three days was determined. Similarly the effect of $M/10$, $M/100$ and $M/1000$ concentrations of the series of iodides was studied. In the table below the separate experiments are designated as Exp. 1, 2, 3 and 4. It will be observed that there was a slight difference in the blank determinations made on the acid alone in the four experiments. Each column, giving the results with one certain concentration, must be considered separately, but all the figures in any one column are strictly comparable.

TABLE VIII.—PERCENTAGE DECOMPOSITION OF $N/10$ HYDRIODIC ACID ALONE AND IN PRESENCE OF VARIOUS IODIDES.

Iodide Present.	Per cent Decomposition of $N/10$ HI in Presence of Iodides in Following Concentrations: Expt. 1, $M/2$.	Expt. 2, $M/10$.	Expt. 3, $M/100$.	Expt. 4, $M/1000$.
Blank (acid alone)	1.3	0.8	1.2	1.1
FeI_2	45.2	4.8	4.7	2.2
MnI_2	22.6	2.4	2.4	1.6
NaI	8.0	0.7	1.5	1.0
SrI_2	8.0	0.7	1.4	1.0
NH_4I	7.7	0.8	1.4	1.1
CaI_2	5.7	0.8	1.3	1.0
KI	4.4	0.8	1.4	1.1
LiI	3.4	1.0	1.4	1.0
MgI_2	1.0	0.8	1.3	1.1
CdI_2	0.8	0.8	1.4	1.0
ZnI_2	0.6	0.4	1.4	1.1
BaI_2	0.0	0.8	1.5	1.0

The foregoing table indicates that the $M/2$ solutions of the iodides divide themselves into four groups with relation to the magnitude of their effects on the decomposition of hydriodic acid. The iodides of the first group, composed of ferrous iodide and manganese iodide, have a marked accelerating influence upon the decomposition of hydriodic acid. Those of the second group, consisting of sodium, strontium and ammonium iodides, have a definite, though smaller, accelerating influence. The third group is made up of calcium, potassium and lithium iodides, which have a slight accelerating effect. In the fourth group are the iodides of magnesium, cadmium, zinc and barium, which have a retarding influence on the rate of decomposition of hydriodic acid. In the lower concentrations, the only iodides which had an appreciable effect were those of iron and manganese, which accelerated the decomposition.

DECOMPOSITION OF HYDRIODIC ACID IN ABSENCE OF OXYGEN.

In order to determine the effect of exclusion of oxygen upon the decomposition of hydriodic acid, $N/10$ HI was placed in ampules sealed with paraffin and exposed under various conditions. The results were as follows:

TABLE IX.

Conditions of Storage.	Percentage Decomposition after 1 day.	2 days.	4 days.	7 days.
Sunlight	1.0	1.1	1.1	2.6
Diffused light	0.2	0.3	0.8	1.0
Dark at room temperature	0.1	0.3	0.7	0.7
Dark in refrigerator	0.0	0.0	0.0	0.2

This experiment shows that decomposition takes place in the absence of oxygen. Since the access of air was prevented by the layer of paraffin, the only oxygen available for oxidation was that dissolved in the liquid. Assuming that the solubility of oxygen in the $N/10$ HI is the same as in water, there would be 0.08 cc. of oxygen dissolved in 10 cc. of the acid. The amount of oxygen necessary to cause 2.6% decomposition, such as shown after seven days, would be 0.29 cc. As only 0.08 cc. was available, it is apparent that the decomposition was greater than could be accounted for on the basis of oxidation by the available oxygen. This result substantiates the statement that part of the decomposition must be accounted for as follows: $2\ HI \longrightarrow H_2 + I_2$.

Effect of Light of Different Wave-Lengths upon the Decomposition of Hydriodic Acid.—In order to determine the effect of different wave-lengths of light on the rate of decomposition of $N/10$ hydriodic acid, tests were made using light filters obtained from the Corning Glass Works. These light filters were in the form of plates of special glass about six inches square. Light-proof and water-proof wooden cabinets were used, in which the special glass plates served as windows. The cabinets were placed on the roof in direct sunlight, the hydriodic acid in pyrex bottles being placed within the cabinets. Eleven different light filters were used. From a study of the results obtained and the data on the light transmitted by the various filters, it was concluded that the part of the spectrum between 4600 and 6000 Å. has the greatest effect of increasing the rate of decomposition of $N/10$ hydriodic acid in pyrex bottles.

DISCUSSION OF RESULTS.

In the work outlined above there are two rather striking results: (1) the marked stability of hydriodic acid in concentrations of $M/100$ and $M/1000$, and (2) the markedly increased rate of decomposition of $N/10$ HI in the presence of $M/2$ concentrations of such iodides as NaI, SrI_2, NH_4I, etc.

It appears that HI decomposes in two ways which may be represented as follows:

(*a*) *By Oxidation.*

$$4HI + O_2 \longrightarrow 2H_2O + 2I_2.$$
$$\Updownarrow$$
$$H^+ + I^-$$

(*b*) *By Decomposition.*

$$2HI \longrightarrow H_2 + I_2.$$
$$\Updownarrow$$
$$H^+ + I^-$$

In both of the equations shown above, the free iodine is formed from molecules of HI, and not from iodide ions. Therefore the rate of deterioration would, to a great extent, be proportional to the concentration of molecules of HI. Any change of conditions which would increase the concentration of HI molecules would be expected to increase the rate of deterioration of HI, and conversely any change causing a decrease in concentration of HI molecules would be expected to decrease the rate of decomposition.

The unusual stability of hydriodic acid of low concentration finds ready explanation on the basis of the hypothesis outlined above. As the dilution of the hydriodic acid increased, there would be an increase in electrolytic dissociation of HI molecules into hydrogen ions and iodide ions. The decrease in HI molecules would decrease the rate of decomposition, as was actually observed in the experiments.

In carrying out the present investigation it was recognized that the various cations might have certain individual specific effects on the rate of decomposition of hydriodic acid. Since each cation must be accompanied by an anion, the cations were added in the form of iodides. Thus there was no new anion added, as the iodide ion was already present in the hydriodic acid solution. The effect of the iodides which had an appreciable accelerating influence (Na, Sr, NH_4) and of those which had a slight accelerating effect (Ca, K, Li) may be most readily explained on the basis of the effect of the iodide ions introduced. Thus sodium iodide in $M/2$ solution would be largely ionized as follows: $Na\ I \rightleftarrows N + I^-$. The iodide ions from this source would cause the following reaction to proceed to the left: $HI \rightleftarrows H^+ + I^-$. Thus the concentration of HI molecules would be increased and there would accordingly be an increase in the rate of decomposition. When the iodides were present in $M/2$ concentration in $N/10$ solution of hydriodic acid, the effect of the iodide ions of the iodide of the metal would be overwhelming. However, in $M/10$, $M/100$ and $M/1000$ concentrations, the iodides would not cause such an increase in concentration of the iodide ion and the effect would be less discernible. This reasoning is in accord with the experimental results, since in $M/10$, $M/100$ and $M/1000$ concentrations, the iodides had practically no effect on the rate of decomposition except in case of the iodides of iron and manganese.

Since ferrous iodide and manganese iodide had a pronounced accelerating effect on the decomposition which was distinct even in $M/1000$ concentration of the salt in a $N/10$ solution of hydriodic acid, it is apparent that Fe^{++} and Mn^{++} ions have a specific catalytic effect in addition to the common ion effect of the other iodides.

On the basis of the hypothesis as outlined above, the addition of an iodide which ionized to only a slight extent would not increase the rate of decomposition, since there would be no appreciable increase in concentration of iodide ion, with resulting increase in concentration of HI molecules. Very little is known regarding the degree of ionization of various salts. However, it is known that most of the soluble iodides are rather highly ionized, with some exceptions, such as cadmium iodide and zinc iodide, which ionize only to a slight extent. Cadmium iodide and zinc iodide were found to have a slight retarding influence on the rate of decomposition. The lack of an accelerating influence may thus be explained on the basis of the lack of the common ion effect. The formation of double iodides, such as $2\ HI \cdot CdI_2$ or H_2CdI_4 would tend to withdraw some HI molecules and by thus lowering their concentration, would increase the apparent stability. Such an effect may be responsible for the slight retarding influence actually observed.

SUMMARY.

1. The rate of decomposition of hydriodic acid is increased by the following factors: (*a*) exposure to air, (*b*) exposure to light, (*c*) increase in temperature and (*d*) increase in concentration.

2. The effect of various iodides in $M/2$ concentration upon the rate of decomposition of $N/10$ hydriodic acid was as follows: marked acceleration, Fe^{++} and Mn; appreciable acceleration, Na, Sr, NH_4; slight acceleration, Ca, K, Li; slight retardation, Mg, Cd, Zn; marked retardation, Ba. Only FeI_2 and MnI_2 had any effect on the rate of decomposition of $N/10$ HI when present in concentrations of $M/10$, $M/100$ or $M/1000$.

3. Experiments were carried out to determine the rate of liberation of free iodine in solutions containing various iodides alone. The only iodides to yield any free iodine within seven days were ferrous and manganese iodides, and these only in the higher concentrations.

4. The results may be explained on the basis of the hypothesis that the rate of deterioration is proportional to the concentration of HI molecules. When the concentration of HI molecules is decreased, as by dilution or formation of double iodides or complex ions, the rate of decomposition is decreased. When the concentration of iodide ions is increased, as by the addition of sodium iodide, the following reaction proceeds to the left: $HI \rightleftarrows H^+ + I^-$. This change increases the concentration of HI molecules and thus increases the rate of decomposition.

5. Since ferrous iodide and manganese iodide have a pronounced accelerating effect on the decomposition, which is distinct even in $M/1000$ concentration of the salt in a $N/10$ solution of hydriodic acid, it is apparent that Fe^{++} and Mn^{++} ions have a specific catalytic effect in addition to the common ion effect of iodides.

6. Iodides which are only slightly ionized, as CdI_2 and ZnI_2, do not accelerate the decomposition of hydriodic acid.

7. Experiments with $N/10$ hydriodic acid in pyrex bottles, placed behind various light filters, indicate that the part of the spectrum between 4600 and 6000 Å. has the greatest accelerating effect on the rate of decomposition when the acid is in pyrex bottles.

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SYNTHETIC ALKALOIDS ENVOLVED IN GERMANY.

The complete synthesis of hydroquinine and hydroquinidine has been announced in Ham burg as an accomplished fact. The scientist responsible for this development states that his experiments lead up to the synthesis of 14 additional alkaloids which have not been found in a natural state. (Consul Knowlton V. Hicks, Hamburg.)

A PHARMACEUTICAL STUDY OF IODINE SOLUTIONS FOR ANTISEPSIS.*

BY CHARLES H. LAWALL AND LINWOOD F. TICE.

Iodine, since its discovery, has been used externally as a counter-irritant. It was used as such prior to the knowledge of antisepsis. The difficulty with the official preparations lies in the fact that being primarily intended for counter-irritants, they are therapeutically contra-indicated for wound treatment, and when used for antiseptic purposes, their irritating properties prejudice the users against iodine preparations for every-day use for antisepsis.

We do not recommend a change in the present official preparations of iodine, but medicine and pharmacy do need new preparations of iodine which can occupy a place in therapeutics as antiseptic preparations which those now official cannot.

A comprehensive study of various solvents was made to find just which one would be the most suitable for preparing an antiseptic iodine solution. The study included the following: Ethanol, methanol, glycerin, benzene, benzin, normal propanol, isopropanol, ethyl ether, chloroform, ethylene glycol, cellosolve, cellosolve acetate, carbitol, propylene glycol, dioxan, diethylene glycol, butyl cellosolve, ethyl acetate, dichlorethyl ether, ethylene dichloride.

All solvents containing the primary alcohol group (CH_2OH) were found to be decomposed by iodine with the formation of hydrogen iodide and the corresponding aldehyde. *E. g.*, ethanol was found to yield hydrogen iodide and acetaldehyde; no traces of ethyl iodide were found. This test was made by first removing iodine by the use of an excess of sodium thiosulphate, then distilling and testing the distillate for ethyl iodide. Control tests were made in which as small an amount as 0.1% ethyl iodide was added and in every case the added ethyl iodide could be recovered and detected, while the specimens of alcoholic solution of iodine, which had shown marked deterioration with the loss of several per cent in strength expressed as free iodine, showed no ethyl iodide when tested in the same manner.

In consequence of such decomposition, the solvent power for iodine of liquids containing primary alcohol groups could not be accurately determined as the solubility of iodine in such solvents was rapidly increased due to the formation of hydrogen iodide as a result of contact between iodine and the solvent.

After a close and careful examination of various solvents from the standpoints of irritation, penetration and stability, the decision was made that ethanol is the most satisfactory solvent for iodine providing optimum conditions in respect to these factors.

It has long been known that potassium iodide will inhibit the decomposition of solutions of iodine in alcohol; such is its use in preparing the present U. S. P. tincture. It became of interest to establish the optimum concentration of added potassium iodide for the promotion of stability. Varying concentrations of iodine alcohol and potassium iodide were mixed and aged and the free iodine as well as the presence or absence of acidity indicating deterioration were determined. It was found that regardless of the alcoholic concentration, in order to prevent deterioration enough potassium iodide must be added to theoretically form KI_3 with the iodine in solution.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Miami meeting, 1931

As a matter of interest, Churchill's Tincture of Iodine which does not contain this requisite amount of iodide, is unstable. However, as its field is chiefly that of a counter-irritant the hydrogen iodide formed would probably act synergistically.

A phenomenon of considerable importance was observed which is additional evidence in favor of the presence of potassium iodide in an antiseptic iodine solution. Iodine was found to pass at a very much increased rate through animal membrane when potassium iodide was added to the iodine solution. These tests were made by using defatted hog's bladder as a diffusion medium, when saturated aqueous solutions of iodine were placed in the diffusing chambers and these were then placed in contact with distilled water containing starch T.S.

Similar experiments were carried on simultaneously with the same iodine solution to which had been added an amount of potassium iodide sufficient to produce the theoretical combination KI_3.

In the presence of this amount of potassium iodide the starch solution would be colored blue within fifteen minutes to a degree of intensity not equalled by the plain iodine solution after an exposure of two hours. Other salts than iodide were added but these were found to be of no value, conclusively showing that the effect was not purely mechanical. The probable explanation of this increase in diffusion rate lies in the combination of iodine with the iodide to form a compound (possibly KI_3) which is more easily permeable to animal membrane. It is known that iodine alone in solution exists in high molecular aggregates. In any case, the addition of a proper proportion of potassium iodide should increase the effectiveness of penetration to both tissue and bacteria.

Steps were next taken to develop a more rational antiseptic iodine preparation for stock and dispensing use. In approaching this problem the current and past pharmaceutical and medical literature was examined in order to learn the opinions of authorities in this field. All were of the same belief, that a seven per cent tincture for antisepsis was excessive in strength.

So that a decision might be made as to what the strength of a preparation should be a preliminary bactericidal study of various strengths of iodine from one to seven per cent was made. It was found that a two per cent solution showed a potency which answered all practical purposes when compared with iodine solutions of both higher and lower strengths, and also when compared with a number of popularly used commercial antiseptics.

A series of experiments was carried out by Dr. George M. Karns of the Iodine Fellowship at the Mellon Institute in order to determine what concentration of ethanol would be most satisfactory as the solvent for a new iodine solution to comply with the requirements previously mentioned. It had been reported previously that an aqueous solution containing 56 per cent by weight of alcohol is devoid of dehydrating properties. It was further found that when using washed blood cells there is a rapid diminution protein coagulation time when the alcohol concentration falls below 50%. From these facts it was decided that Diluted Alcohol U. S. P. (48.4–49.5% by vol.) would provide a concentration, which although possessing a sufficient degree of penetration and evaporation would still not cause dehydration or blood-cell coagulation, and would enable the solvent to evaporate with sufficient rapidity to meet the demand for a popular antiseptic for local application.

In view of the fact that an antiseptic iodine solution would be utilized in many cases as a general antiseptic and consequently subject to dilution it was considered necessary to have present in the solution enough potassium iodide to render the iodine present soluble regardless of the degree of dilution to which it was subjected, a feature not possessed by the present U. S. P. tincture. This figure should at the same time be in excess of the amount of iodide necessary to maintain a solution that would not be subject to deterioration.

It was found that a solution of this type, namely, 2 per cent iodine and 2.4 per cent potassium iodide, would in regard to its saline content be isotonic with human blood serum, a factor which would considerably minimize the pain of application.

The iodine present being undissociated would not appreciably affect the tonicity and due to the much higher molecular weight, 2.4% potassium iodide, the preparation would have the same osmotic pressure as one containing 0.85% sodium chloride.

In a brief summary the salient features of this new preparation are as follows:

1. Germicidal effectiveness (as shown by the paper contributed by Dr. Louis Gershenfeld and Miss Ruth E. Miller).
2. Minimized irritation by low alcoholic content.
3. Approximate isotonicity with blood serum in its saline content.
4. Perfect miscibility with water.

A formula for this preparation is as follows:

ALCOHOLIC IODINE ANTISEPTIC SOLUTION.

Iodine	20 Gm.
Potassium iodide	24 Gm.
Diluted alcohol U. S. P. q. s. to make	1000 cc.

To the iodine and potassium iodide contained in a glass-stoppered bottle add 900 cc. of diluted alcohol. Shake well until dissolved and then add sufficient diluted alcohol to make the finished product measure 1000 cc.

This preparation which would answer all of the requirements for dispensing in a small sized applicator bottle for popular use possesses the dual characteristics of effectiveness, non-irritating qualities and stability.

Still another (and much weaker) antiseptic solution of iodine was produced which is suitable for wound irrigation and which was found to be of surprising effectiveness from the bacteriological standpoint.

The formula for this preparation is as follows:

ANTISEPTIC SOLUTION OF IODINE, WEAK, FOR IRRIGATION PURPOSES.

Iodine, powdered	1 Gm.
Sodium chloride	8.5 Gm.
Distilled water q. s. to make	1000 cc.

To the sodium chloride add 950 cc. of distilled water, agitate until dissolved, then add the powdered iodine and enough distilled water to make 980 cc. Agitate occasionally until the iodine is dissolved. Then filter, determine the iodine content by volumetric assay with $N/100$ sodium thiosulphate solution and adjust to a concentration of 0.02% free iodine. An excess of iodine is purposely used in making this preparation in order to ensure the proper strength of the finished product.

Upon the basis of a few bacteriological tests the germicidal effectiveness of this solution was found to be of marked value. Five cc. of the undiluted solution were

found to kill 1 cc. of a 24-hour culture of *B. Typhosus* and also of *staphylococcus aureus* within two minutes. Five cc. of a 1:10 dilution killed 0.1 cc. of a 24-hour culture of *B. Typhosus* within two minutes.

This solution was found to possess solvent properties similar to Dakin's solution.

This solution has also been found to be excellent for sterilizing maggot eggs used for the production of larvæ for cleaning wounds.

It is superior to the bichloride of mercury solution hitherto employed for this purpose in that, when the iodine solution is used, fewer eggs are killed and complete sterility is obtained.

In presenting the formulas for those two new non-proprietary solutions of iodine to the medical and pharmaceutical professions, it is believed that a contribution has been made which will be appreciated from the combined standpoint of economy and efficiency.

CONTRIBUTED BY THE IODINE SCHOLARSHIP OF THE PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE UNDER THE DIRECTION OF THE IODINE FELLOWSHIP OF THE MELLON INSTITUTE.

NITROSYL CHLORIDE WITH ALCOHOLS AND ALDEHYDES.

BY FRANK A. LEE AND E. V. LYNN.

As has been demonstrated (1, 2, 3), aliphatic hydrocarbons react with nitrosyl chloride to form isonitroso compounds. It has also been shown (4) that alkyl ketones undergo similar change and, at the same time, some of them (5) are chlorinated. Similarly, it has been found that certain alcohols (6) are readily converted to the corresponding nitrites. In view of the generic relationship, it seemed of interest to determine the effect upon aldehydes.

In 1903, Bouveault and Wahl (6) showed that nitrosyl chloride will react with certain alcohols in the presence of pyridine to form nitrites. All these alcohols were of fairly high molecular weight, the simplest one being isoamyl alcohol. We have now applied this reaction to other compounds with similar results and find that pyridine is not necessary with those of low molecular weight. It is notable also that this reaction apparently does not take place with glycerin, menthol and benzyl alcohol.

The aldehydes evidently react in a manner analogous to that of isonitrosoketones (5), giving rise to chlorides of the corresponding acids. Benzaldehyde gave benzoyl chloride and benzoic acid; acetaldehyde probably behaves in a similar way to a smaller extent. This ability of nitrosyl chloride to chlorinate is in conformity with previous experiments on ketones (5).

EXPERIMENTAL.

The nitrosyl chloride which was employed was made according to the method as previously described (4).

Ethyl Nitrite.—Absolute ethyl alcohol was placed in a vessel surrounded by a freezing mixture of ice and salt and the gas was run in to the point of saturation, as judged by the appearance of a deep reddish brown color. The product was poured into ice water, and a considerable effervescence and separation of yellow liquid followed. This yellow liquid was removed, washed with a cold solution of sodium

carbonate, and dried over anhydrous potassium carbonate. Distillation of this product gave an amount boiling below 18° C. equivalent to 70 per cent of the theoretical. Analysis by the gasometric method of the United States Pharmacopœia showed a purity of 97 per cent.

0.179 Gm. gave 56 cc. NO at 22° C. and 760 mm.
0.130 Gm. gave 41 cc. NO at 21° C. and 760 mm.
Percentage of NO found: 38.8 and 39.2; calculated: 40.0.

Because of the rapidity of the formation of the ethyl nitrite, the possibility of the production of sweet spirit of nitre by this method was considered. Should nitrosyl chloride be passed into an excess of ethyl alcohol, the ethyl nitrite formed would be in solution in alcohol. Hydrochloric acid is a by-product of the reaction. Subsequent neutralization of the acid, followed by an assay to determine the nitrite content of the product, and dilution to the required strength with alcohol is the procedure that should be carried out.

The work described under the preparation of ethyl nitrite was repeated, using isopropyl, normal butyl and tertiary butyl alcohols. The corresponding nitrites were obtained in each case. It should be made clear, however, that pyridine, equal in quantity to the alcohol used, should be present when nitrites are made from tertiary alcohols. It appears that unless this is done, satisfactory products cannot be obtained. As the molecular weight of the alkyl group increases, it was found that more satisfactory yields are obtained when pyridine is used.

Nitrite of Methyl Diethyl Carbinol.—The alcohol, which was made by means of the Grignard reaction, was saturated with nitrosyl chloride in the presence of an equal quantity of pyridine, the whole being kept at about —10° C. by means of a freezing mixture. The product was added to cold water and the yellow oil which separated was dried, treated with more pyridine, and then resaturated with the gas. After repeating the process once more, the oil was submitted to distillation under reduced pressure. The product is a pale yellow liquid with very little odor. It decomposes if boiled under atmospheric pressure but distils unchanged at 24° C. under 10 mm. From 40 Gm. of the alcohol there were obtained 32 Gm. of nitrite, a yield of 62 per cent.

0.191 Gm. gave 35.0 cc. NO at 20° C. and 740 mm.
0.180 Gm. gave 33.0 cc. NO at 18° C. and 736 mm.
Percentage of NO found: 22.2 and 22.3; calculated: 22.9.

Nitrite of Triethyl Carbinol.—The alcohol was made by the Grignard method and saturated with nitrosyl chloride in the presence of pyridine as before. The product was a yellowish liquid with slight nitrite-like odor, boiling at 36° C. under 10-mm. pressure. Like the previous compound, it decomposes when boiled under atmospheric pressure. The yield was 55 per cent of theoretical.

0.138 Gm. gave 22.2 cc. NO at 18° C. and 746 mm.
0.190 Gm. gave 30.6 cc. NO at 19° C. and 746 mm.
Percentage of NO found: 19.8 and 19.7; calculated: 20.7.

Nitrite of Diethyl Propyl Carbinol.—The alcohol was prepared as were the foregoing ones. The reaction with nitrosyl chloride and pyridine gave 61 per cent of a yellowish liquid with slight odor of nitrites, boiling at 48° C. under 10-mm. pressure, and decomposing when boiled under atmospheric pressure.

0.168 Gm. gave 24.5 cc. NO at 17° C. and 744 mm.
0.151 Gm. gave 22.3 cc. NO at 15° C. and 732 mm.
Percentage of NO found: 18.0 and 18.1; calculated: 18.8.

Thymol.—A solution of thymol in carbon tetrachloride was saturated with nitrosyl chloride at room temperature. The red solution gradually turned green and deposited a greenish brown precipitate of nitrosothymol. The yield amounted almost to theoretical. The melting point was found to be 163° C.

Antipyrine.—In view of the easy transformation of thymol, antipyrine was treated in a similar manner, using chloroform as the solvent. There was an immediate green color and a rapid formation of a brown precipitate of nitrosoantipyrine. The yield obtained was 80 per cent.

Other Alcohols.—Although several of them seemed to react readily with nitrosyl chloride, the nitrites of glycerin, benzyl alcohol, ethylene glycol, menthol, trimethylene chlorhydrin and chloretone were not obtained under the experimental conditions used. Glycerin reacted to a limited extent, but the chief product appeared to be acrolein by dehydration.

Benzaldehyde.—Benzaldehyde was treated with a solution of sodium carbonate and occasionally shaken, for several days, to remove free acid. It was then separated, dried, and distilled in an atmosphere of nitrogen. The distillate, which was found to be free from benzoic acid, was treated repeatedly with nitrosyl chloride until saturated, keeping the mixture at all times in an atmosphere of nitrogen or carbon dioxide. Without allowing the air to enter the container, it was exposed to direct sunlight. The red color was changed to yellow. More nitrosyl chloride was run in under the same conditions and the mixture was exposed to the sunlight, as before. After several such treatments, the product was fractionated under ordinary pressure. From 46 Gm. of the original aldehyde, 14 Gm. of unchanged material and 7 Gm. of benzoyl chloride were obtained. This latter fraction, of course, had an odor of benzoyl chloride and was readily convertible to benzamide and benzoic acid in the usual way. The residue from distillation was solid and proved to be almost entirely benzoic acid. The recrystallized material had a melting point of 120–121° C.

There is a possibility that the benzoyl chloride might be formed from benzoic acid previously produced by an oxidizing action of nitrosyl chloride. In order to determine whether this is the case, a sample of pure benzoic acid was dissolved in benzene, saturated with the gas, and exposed to the sunlight for several days. The product, however, gave no evidence of containing any benzoyl chloride.

Acetaldehyde.—Purified acetaldehyde was dissolved in three times its volume of benzene, treated with nitrosyl chloride, and exposed to the sunlight. In a very short time the reddish brown color had disappeared, and, at the same time, a straw-colored, heavy, viscous oil separated. The benzene mixture was treated several times in the same way. Finally, it was removed and distilled. The part boiling below 55° C. was warmed with water to decompose any acetyl chloride and the water solution was analyzed. Evidences of the presence of acetic acid were obtained. Another part of the distillate was heated with aniline and the resulting mixture was extracted with hot water. Crystals, which responded to tests for acetanilid, separated on cooling. While the results do not prove that acetyl chloride was produced, it would seem reasonable to conclude that such was the

case. However, the amount of conversion was too small to permit any closer identification.

The oily precipitate was found to be non-volatile in a vacuum, even at high temperatures. It reacted readily with water or alcohol to produce a white, amorphous solid, which possessed no characteristic melting point and contained no nitrogen or chlorine. It was probably a polymerized aldehyde, but it was not examined further.

SUMMARY.

1. All aliphatic alcohols tried give nitrites by treatment with nitrosyl chloride. With increase in molecular weight, pyridine as a condensation agent is necessary. When nitrites of tertiary alcohols are being prepared, pyridine should be used. The nitrites of diethyl propyl carbinol, triethyl carbinol and methyl diethyl carbinol were also made. The nitrite of diethyl propyl carbinol was made by others, as noted, but the product was not vacuum distilled and physical data were not determined.

2. Benzyl alcohol, glycerin, ethylene glycol, trimethylene chlorhydrin, menthol and chloretone gave no nitrites under the experimental conditions used.

3. Thymol and antipyrine are converted to the corresponding nitroso compounds.

4. Benzaldehyde is converted to benzoyl chloride and benzoic acid. Acetaldehyde apparently behaves in a somewhat similar manner.

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SUGGESTED ASSAYS FOR SOME N. F. PREPARATIONS.*

1. ANTISEPTIC SOLUTION.

BY S. W. GOLDSTEIN.

The most important ingredient of Antiseptic Solution, N. F. V, from the standpoint of therapeutic value, is probably boric acid. A method for the determination of the latter, therefore, appears to be desirable. The procedure suggested on page 129 is one for the direct titration of boric acid and has been found to give concordant results.

Reagents.—1. Glycerin
2. 0.1 *N* Sodium hydroxide solution
3. Phenolphthalein test solution.

* From the laboratory of A. G. DuMez, Professor of Pharmacy, School of Pharmacy, University of Maryland.

Procedure.—Add 5 cc. of Antiseptic Solution to a mixture of 10 cc. of glycerin and 5 cc. of distilled water contained in an Erlenmeyer flask. Add 3 drops of phenolphthalein test solution, and titrate with 0.1 *N* sodium hydroxide solution until a faint pink color persists.

Each cc. 0.1 *N* sodium hydroxide = 0.006192 Gm. boric acid.

A control should be run with the glycerin and water used in the assay.

Suggested Standard.—Antiseptic Solution contains in each 100 cc., not less than 2.45 Gm. and not more than 2.55 Gm. of H_3BO_3.

DISCUSSION.

A solution was prepared according to the directions in the N. F. V, with the exception that the boric acid was omitted. This solution was found to be neutral to phenolphthalein test solution.

A series of assays was then run on the official solution containing the required amount of boric acid with the following results:

TABLE I.—TITRATION OF BORIC ACID.

Cc. Antiseptic Solution.	Glycerin.	Distilled Water.	Cc. 0.1 *N* NaOH.	Gm. H_3BO_3.
5	20	20	20.18	0.1249
5	20	20	20.28	0.1255
5	20	10	20.14	0.1247
5	20	10	20.28	0.1255
5	10	5	20.20	0.1250

The Antiseptic Solution, glycerin and distilled water may all be added by means of pipettes; only the alkali requires a burette.

The accuracy of the method was still maintained when the glycerin content of the titration mixture was as low as 30 p. c. v/v.

2. ALKALINE AROMATIC SOLUTION.

BY S. W. GOLDSTEIN.

The alkali content of Alkaline Aromatic Solution, N. F. V, is largely responsible for its efficacy. A method for the determination of total alkalinity has, therefore, been devised. The procedure is simple and was found to give satisfactory results.

Reagents.—1. 0.1 *N* Sulphuric acid solution
2. 0.1 *N* Sodium hydroxide solution
3. Phenol red test solution, U. S. P.

Procedure.—To 50 cc. of distilled water contained in a 250-cc. Erlenmeyer flask or a beaker add 1 cc. of the Alkaline Aromatic Solution, 2 drops of phenol red test solution, and 4 cc. of 0.1 *N* sulphuric acid solution, accurately measured from a burette. Titrate the excess sulphuric acid with 0.1 *N* sodium hydroxide solution until a salmon color appears and persists for one minute.

Deduct the number of cc. of 0.1 *N* alkali consumed from the 4 cc. of 0.1 *N* acid used to find the alkalinity of 1 cc. of the solution.

Suggested Standard.—Each cc. of Alkaline Aromatic Solution requires for neutralization not less than 2.9 cc. and not more than 3.2 cc. of 0.1 *N* sulphuric acid solution.

DISCUSSION.

Choice of Indicator.—Phenol red was chosen as the indicator rather than the more common indicators because it gives the sharpest end-point, under the conditions, and its p_H range is nearest the field of exact neutrality. The indicator is red in alkaline medium at a p_H of 8.6, and it is yellow in acid medium at a p_H of 6.8.

Determination of Best End-Point.—A solution was prepared according to the formula for Alkaline Aromatic Solution with the exception that the cudbear was omitted. The above assay was carried out, using this solution, with the following modification: Instead of back-titrating with alkali to the appearance of a red tint, the solution was back-titrated to the disappearance of the yellow color which is present at a p_H of 6.8. This brought the end-point nearer to a p_H of 7.0, or exact neutrality. The end-point or color change that occurs at that point in the titration of the official solution was then noted and introduced into the assay.

Accuracy of the Method.—A series of assays was run on different samples of the official solution by this method, and the following results were obtained:

TABLE II.—TITRATION OF TOTAL ALKALINITY.

Cc. Alkaline Aromatic Solution.	Cc. 0.1 *N* H_2SO_4 Added.	Cc. 0.1 *N* NaOH Added.	Cc. 0.1 *N* H_2SO_4 Consumed.
1	4.0	0.829	3.171
1	4.0	0.829	3.171
1	4.0	0.879	3.121
1	4.0	0.838	3.162
1	4.0	0.921	3.079
1	4.0	0.916	3.084

Some difficulty in determining the end-point may be experienced due to the variation of the color of the orchil present in the cudbear, but this interference is of small importance and should not exist after a few trial assays.

3. SPIRIT OF FORMIC ACID.

BY EMANUEL V. SHULMAN.

Formic acid is the therapeutically active ingredient of Spirit of Formic Acid, N. F. V. The formic acid, however, is not all present in the free state as a portion of it combines with the alcohol-forming ethyl formate. A method has, therefore, been devised for the determination of total formic acid. The method is simple and gives satisfactory results.

Reagents.—1. 0.1 *N* Sodium hydroxide solution
2. 0.1 *N* Sulphuric acid solution
3. Phenolphthalein test solution

Procedure.—To 40 cc. of 0.1 *N* sodium hydroxide solution contained in a 250-cc. glass-stoppered flask, add 10 cc. of the spirit, accurately measured; warm the flask to 50° C. and set aside for about ten minutes. Titrate the excess alkali using 0.1 *N* sulphuric acid and phenolphthalein T.S. as indicator. Each cc. of 0.1 *N* sodium hydroxide corresponds to 0.0046 Gm. of formic acid.

Suggested Standard.—Spirit of Formic Acid contains not less than 1.0 Gm. and not more than 1.1 Gm. of total formic acid, free and as ester, in each 100 cc.

DISCUSSION.

The speed of the equilibrium reaction between the formic acid and the alcohol is slow as can be determined by the direct titration of the free acid present in the spirit. This reaction is reversed by the presence of free alkali and may be hastened by raising the temperature of the solution. Titrations were made with boiling solutions which in some cases gave slightly higher results than expected. This may have been due to the use of unneutralized alcohol in making the spirit.

Choice of Indicator.—Phenolphthalein was selected as the indicator for titration because the p_H values of dilute solutions of sodium formate were found to fall well within its range.

The following are typical results obtained with this method:

TABLE III.—TITRATION OF FORMIC ACID.

Cc. of Spirit.	Cc. of 0.1 *N* NaOH Required for Neutralization.	Equivalent Weight of HCOOH.	Theoretical Weight of HCOOH.
10	23.0	0.1058	0.1083
10	23.63	0.1087	0.1083
10	23.68	0.1089	0.1083
10	23.33	0.1073	0.1083

Calculation of Theoretical Weight of Formic Acid.—The formic acid used in the preparation of the spirit assayed 25.51 p. c. with a specific gravity of 1.0615, which is equal to 27.07 Gm. of pure formic acid in 100 cc. Spirit of formic acid contains 4 p. c. of formic acid by volume or 1.083 Gm. in 100 cc. or 0.1083 in 10 cc. The standard proposed was similarly calculated, using the percentage strength limits and specific gravity value for formic acid given in the National Formulary.

4. ANISATED SPIRIT OF AMMONIA.

BY EMANUEL V. SHULMAN.

A method has been devised for the determination of total ammonia in Anisated Spirit of Ammonia, N. F. V. The following procedure which is simple was found to give satisfactory results.

Reagents.—1. Alcohol, neutral to phenolphthalein
2. 0.1 *N* Sulphuric acid solution
3. Methyl red test solution.

Procedure.—Pour 20 cc. of alcohol, made neutral to phenolphthalein into a 100-cc. Erlenmeyer flask, add exactly 2 cc. of the spirit and titrate with 0.1 *N* sulphuric acid using methyl red T.S. as indicator. Each cc. of 0.1 *N* sulphuric acid corresponds to 0.0017 Gm. of ammonia.

Suggested Standard.—Anisated Spirit of Ammonia contains not less than 1.8 Gm. and not more than 2 Gm. of NH_3 in each 100 cc.

DISCUSSION.

Alcohol is used in the assay to prevent the precipitation of the anethol present in the spirit during titration. The quantity of alcohol specified will keep the solution clear regardless of the condition of the spirit; usually 10 to 15 cc. of alcohol are sufficient for the official preparation.

Choice of Indicator.—Of the commonly used indicators, methyl red was found to give the most sharp and definite end-point, hence its selection.

Typical results obtained with the use of this method are given in the following table:

TABLE IV.—TITRATION OF TOTAL AMMONIA.

Cc. of Spirit.	Cc. of Alcohol Used.	Cc. of 0.1 H_2SO_4 Required.	Equivalent Weight of NH_3 Gm.	Theoretical Weight of NH_3 Gm.
2	15	22.57	0.0384	0.0386
2	15	22.55	0.0383	0.0386
2	20	22.65	0.0385	0.0386
2	20	22.22	0.0380	0.0386

Calculation of Theoretical Weight of Ammonia.—The ammonia water used in the preparation of the spirit assayed 10.06 p. c. of ammonia with a specific gravity of 0.9593, which is equal to 9.65 Gm. of ammonia in 100 cc. of ammonia water. Anisated Spirit of Ammonia contains 20 p. c. by volume of ammonia water or 1.93 Gm. of ammonia in 100 cc. of the spirit or 0.0386 in 2 cc. The standard proposed was similarly calculated using the percentage strength variations and specific gravity value stated for ammonia water in the U. S. P. X.

A PHYSICOCHEMICAL STUDY OF SOLUTION OF MAGNESIUM CITRATE.*

BY MARGARETHE OAKLEY AND JOHN C. KRANTZ, JR.

INTRODUCTION.

The recognition of a solution of magnesium citrate in the United States Pharmacopœia of 1850 heralded the appearance of scores of papers concerned with various ramifications of this galenical over the last eight decades. An interesting bibliography of this work has been compiled by Professor Langenhan (1). The increasing of the quantity of citric acid per bottle (350 cc.) from 33 Gm. to 35 Gm. precipitated anew the discussion of this product. The pivots around which most of the discussion revolved were the increased acidic taste of the solution and the relative therapeutic efficacy of acid magnesium citrate and the normal salt. Among other writers the new formula for solution of magnesium citrate was defended ardently by Seltzer (2) in 1927 and vehemently maligned by Neimeth (3) in 1929.

It is not the purpose of this investigation to promulgate the adoption of either formula, but to study certain interesting physicochemical aspects involved in the preparation.

ACIDITY AND ACID TASTE.

Much work has been conducted to determine the relationship existing between acid taste, hydrogen-ion concentration and titratable acidity. In 1898 Kastle (4) found a relationship existing between the acid taste and the affinity constants of nineteen different acids in $N/50$ concentration. The threshold concentrations at which various acids exhibited an acidic taste has been studied by Schreiber (5). For citric acid the threshold concentration was found to be about 0.0025 per cent. Harvy (6) made a comprehensive study of the subject and found that total acid concentration and hydrogen-ion concentration were factors in determining acid taste. Through these investigations the influence of buffer salts

* Scientific Section and Section on Practical Pharmacy, Miami meeting, 1931.

upon the acid taste of solutions was studied. In general it was found that the presence of buffer salts decreased perceptibly the hydrogen-ion concentration at which the threshold acid taste was detected.

EXPERIMENTAL.

Solutions of magnesium citrate were prepared using 33 Gm. and 35 Gm. per 350 cc., respectively. The sodium bicarbonate was included. The hydrogen-ion concentration of each solution was determined electrometrically using a Wilson (7) type hydrogen electrode. The results are given in Table I.

TABLE I.

Solution of magnesium citrate	33 Gm. citric acid	p_H 3.92
Solution of magnesium citrate	35 Gm. citric acid	p_H 3.82

To form the acid salt $MgHC_6H_5O_7$ requires 32.4 Gm. of citric acid including the acid neutralized by the sodium bicarbonate. Therefore, the formula requiring 35 Gm. has present in it about 2.6 Gm. of free citric acid: The change in hydrogen-ion concentration is very slight, which is what one would expect in system of a high buffer capacity.

Solutions of citric acid in various molar concentrations were prepared and their hydrogen-ion concentrations determined. These data are given in Table II.

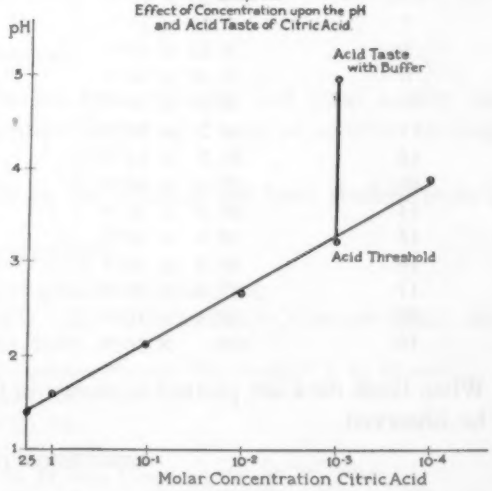
TABLE II.

Molar Conc. Citric Acid.	p_H.
2.5	1.39
1.0	1.61
0.1	2.14
0.01	2.63
0.001	3.16
0.00001	3.92

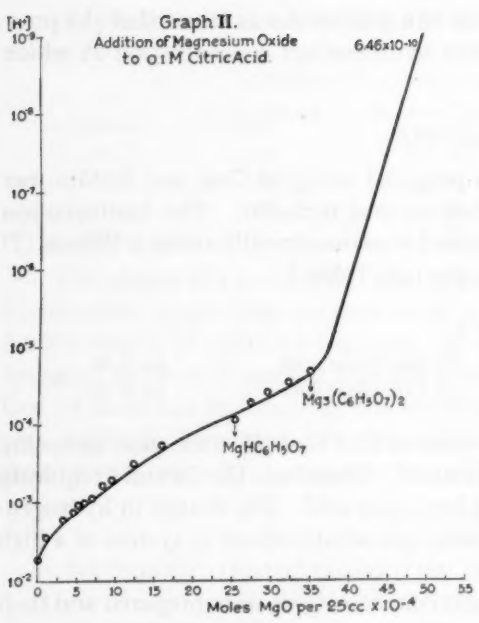
These data are plotted in Graph I. The graph indicates that the threshold acid taste for citric acid is 0.001 molar concentration or about 0.02 per cent. This value is approximately ten times the threshold concentration observed by Schreiber (5). The p_H of this solution is 3.16. When, however, about 0.5 cc. of tenth-normal magnesium citrate solution is added to 10 cc. of 0.001 molar citric acid solution, the p_H is changed to about 4.7 but the acid taste is very markedly accentuated. Thus in the preparation, the acid taste of the free acid is likely accentuated by the buffer salts present.

Graph I

Effect of Concentration upon the pH and Acid Taste of Citric Acid



The pharmaceutical literature has contained many papers discussing the



nature of the magnesium salt present in the solution. Possibly the most recent of these investigations was conducted by Rees (8). He showed that the deposit found in the bottom of solution of magnesium citrate bottles was tribasic magnesium citrate. By studying the velocity of inversion of the sucrose present, this investigator arrived at the conclusion that the tribasic citrate was present in the solution dissolved in citric acid solution. It is doubtful that the evidence produced justified this conclusion. As matter of general interest the present authors studied the changes in hydrogen-ion concentration which occur when pure magnesium oxide is added to a citric acid solution. Various amounts of pure magnesium oxide were dissolved in 25-cc. portions of 0.1 molar citric acid solution and the hydrogen-ion concentration determined as described previously. These data are shown in Table III.

TABLE III.

Number.	Moles MgO.	p_H.	$[H^+]$.
0	0	2.14	7.25×10^{-3}
1	1.24×10^{-4}	2.32	4.79×10^{-3}
2	2.48×10^{-4}	2.50	3.16×10^{-3}
3	3.72×10^{-4}	2.61	2.46×10^{-3}
4	4.96×10^{-4}	2.73	1.86×10^{-3}
5	5.45×10^{-4}	2.77	1.70×10^{-3}
6	6.20×10^{-4}	2.83	1.48×10^{-3}
7	7.20×10^{-4}	2.90	1.26×10^{-3}
8	8.45×10^{-4}	3.07	8.51×10^{-4}
9	9.93×10^{-4}	3.15	7.08×10^{-4}
10	12.4×10^{-4}	3.31	4.90×10^{-4}
11	16.7×10^{-4}	3.59	2.57×10^{-4}
12	25.5×10^{-4}	3.99	0.102×10^{-4}
13	27.3×10^{-4}	4.09	8.13×10^{-5}
14	29.8×10^{-4}	4.22	6.03×10^{-5}
15	32.3×10^{-4}	4.37	4.27×10^{-5}
16	34.8×10^{-4}	4.55	2.82×10^{-5}
17	37.4×10^{-4}	4.70	2.00×10^{-5}
18	50.1×10^{-4}	9.19	6.46×10^{-10}
19	100×10^{-4}	9.63	2.35×10^{-10}

When these data are plotted as shown in Graph II, an interesting relationship may be observed.

DISCUSSION OF RESULTS.

There are two interesting and pertinent observations that may be gleaned from a study of the graph.

First, when one equivalent of magnesium oxide has been added for one equivalent of citric acid as occurs in determination No. 12, the hydrogen-ion concentration is very close to that found in the solution when 33 Gm. of citric acid is used per bottle. The 15 Gm. of official magnesium carbonate consumes about 32.4 Gm. of citric acid. This would seem to point to the existence of large quantities of the compound $MgHC_6H_5O_7$ in the solution.

Second, until determination No. 17 there are no inflexions in the curve. Here the presence of an excess of magnesium oxide is responsible for the tremendous increase in hydroxyl-ion concentration. One would anticipate this type of neutralization curve from the relative magnitudes of the dissociation constants (9) of citric acid. The primary constant is 1.0×10^{-3}, the secondary is 2.5×10^{-5}, and the tertiary is 1.5×10^{-6}. Slightly different values are given by other authors for the secondary and tertiary constants. With a polybasic acid, having dissociation constants relatively so close to each other, the neutralization of the tertiary hydrogen-ions would occur before all of those ions arising from the primary and secondary dissociation are neutralized. Thus a gradual slope rather than an inflexion on the curve is in accordance with theoretical considerations. Thus when a chemical equivalent of magnesium oxide is added to an equivalent of citric acid, in addition to the formation of $MgHC_6H_5O_7$: undoubtedly there exists also in equilibrium with this compound some $Mg_3(C_6H_5O_7)_2$. The conversion of a considerable quantity of the acid salt into the normal salt, with which it is in equilibrium, is probably responsible for precipitation. Hence, the presence of an excessive quantity of citric acid would tend to shift the equilibrium in the direction of the acid salt and thus favor stability. Referring again to the curve, the secondary and tertiary constants differ from each other in magnitude about sixteen fold. Based upon an approximate mathematical analysis of titration curves Auerbach and Smolezyk (10) showed that unless the dissociation constants differed by more than sixteen fold no inflexion in the neutralization curve would exist and the curve would resemble that of a monobasic acid. The findings of the authors, although involving the variation of a divalent base seem to substantiate this assumption with citric acid.

SUMMARY.

1. The relation between hydrogen-ion concentration and total acidity for citric acid has been studied. Its application to the acid taste of solution of magnesium citrate has been emphasized.

2. The nature of the salt presence in the solution has been studied from a physicochemical standpoint.

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BUREAU OF CHEMISTRY, MARYLAND STATE DEPARTMENT OF HEALTH.

THE ASSAY OF SPIRIT OF ETHYL NITRITE.*

BY WILLIAM F. REINDOLLAR AND JOHN C. KRANTZ, JR.

INTRODUCTION.

The Netherlands' Pharmacopœia (1) employs an argentimetric assay for its preparation "Spiritus Nitri dulcis," an alcoholic solution containing between 2 and 2.5 Gm. of ethyl nitrite in 100 cc. This process was recommended by Herting (2) as a substitute for the official gasometric assay. The method was studied extensively by L. van Itallie, *et al.* (3) and certain desirable modifications were established. The principle depends upon the oxidation of ethyl nitrite to nitrate by means of potassium chlorate in acid solution, and the argentimetric estimation of the resulting potassium chloride. In the method as given by the Netherlands' Pharmacopœia, the silver chloride after precipitation is not filtered from the reaction mixture and hence a permanent end-point with the indicator, iron alum, is not obtained.

With the purpose of investigating the possibilities of the simple volumetric assay for a Pharmacopœial method this study was begun.

EXPERIMENTAL.

After various modifications of the argentimetric method the following procedure was adopted as giving the best results.

> Introduce into a 50-cc. volumetric flask, successively 10 cc. of distilled water, 5 cc. of 5 per cent solution of potassium chlorate, 5 cc. of Spirit of Ethyl Nitrite, accurately measured and 5 cc. of diluted nitric acid. Stopper the flask, shake well and allow it to stand fifteen minutes. Add 15 cc. of tenth-normal silver nitrate solution. Make up to volume with distilled water, filter and titrate the excess of silver nitrate in 25 cc. of the filtrate with tenth-normal potassium sulphocyanate using ferric ammonium sulphate T.S. as an indicator. Each cc. of tenth-normal silver nitrate consumed corresponds to 0.0225 Gm. of $C_2H_5.NO_2$.

Several commercial samples and other samples of Spirit of Ethyl Nitrite prepared in this laboratory were assayed by this method and also by the present official gasometric method. The results are given in Table I.

TABLE I.—GM. ETHYL NITRITE PER 100 CC.

Sample.	Volumetric Assay.	Gasometric Assay.
1	4.41	(1) 4.51
	4.41	4.50
2	7.02	(2) 6.82
	7.09	6.82
	6.95	....
	6.95	....
3	2.61	(3) 2.42
	....	2.42
4	3.33	(4) 2.99
	3.33	3.02
5	2.86	(5) 2.72
	2.86	2.72
6	4.40	(6) 4.07

* Joint Session Scientific Section and Section on Practical Pharmacy and Dispensing, Miami meeting, 1931.

	4.40		3.94
	4.40		....
	4.40		....
	4.40		....
7	3.65	(7)	3.52
	3.65		3.54
8	3.12		3.09
	3.12	(8)	3.08
	3.12		....
	3.01		....
	3.20		....
9	1.80	(9)	1.80
	1.98		1.76
10	2.65	(10)	2.54
	....		2.54
11	4.00	(11)	3.83
	4.00		3.74

These results indicate that there is a reasonable agreement between the gasometric and volumetric methods, however the results obtained by the volumetric method are somewhat higher.

It is a generally accepted procedure when gas volumes are measured for the purpose of analysis, to make a substractive correction for the vapor tension of the liquid over which the gas is measured. The Pharmacopœia makes no provision for this correction. It was thought advisable, therefore, to determine the vapor tension of the reaction mixture resulting from the decomposition in the assay. A small portion of this liquid was sealed in a gelatin capsule and inserted in an inverted tube containing dry mercury. When the capsule rose to the surface of the mercury it was broken by the expansion of the vapor of the liquid caused by the application of gentle heat. The height of the column of mercury was measured before the introduction of the liquid and at various temperatures after equilibrium was established. These data are given in Table II.

TABLE II.

	Temperature.	Vapor Pressure, mm.
Column in mm. before 755	17.2°	23
	19.2°	26
	20.0°	24
	21.5°	31
	22.0°	33
	24.3°	38
	25.0°	39
	27.8°	42
	29.1°	45
	30.3°	50

This correction of the barometric pressure is quite large at 25° C. corresponding to approximately 5 per cent of the entire gas pressure. If this correction were applied to the foregoing determinations, the results would be brought further below the volumetric determination.

In a subsequent communication the authors propose to report the results of an investigation designed to determine which of these two methods gives the more accurate results and the applicability of the determined vapor tension correction.

SUMMARY.

1. The vapor tension of the reaction mixture in the assay of Spirit of Ethyl Nitrite has been determined.

2. Results on the argentimetric and gasometric methods have been compared.

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MARYLAND STATE DEPARTMENT OF HEALTH.

A TOXICOLOGICAL INVESTIGATION OF PHENOL AND IODINE.*

BY L. W. RISING AND E. V. LYNN.

Few of the modern poisons are as easily accessible to the public as phenol and iodine, owing to their widespread use as household disinfectants and germicides. In the last few years they have been very near the top of the list of poisons causing death in the United States and England.

Toxicologists are therefore many times called upon to examine chemically viscera containing one or the other of these drugs. Methods for analysis of both chemicals are well worked out but there are still certain questions pertinent to toxicology which should have further attention. They are the effect of the common tissue preservants on the recoverable amount of the drugs; the probable rate of disappearance of the specific poison in a preserved or decomposing cadaver; the possibility of organic combinations with the tissue rendering the lethal material, in the case of phenol, not amenable to the ordinary analytical technics; and in the case of iodine the possibility of a shorter method for its determination which is sufficiently accurate for chemico-legal work.

To make the necessary quantitative observations which would in a broad way answer these questions furnish thereby certain standard or comparative data for medico-legal cases, a series of specimens of organic material in contact with known quantities of phenol or iodine and one or no preservative were set up. The procedure for this part of the work was that used in similar previous investigations of other poisons.[1]

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* Scientific Section, A. PH. A., Miami meeting, 1931.

[1] The plan was to subject the poisons as nearly as possible to all of the conditions they might encounter in a body after death. Some of the specimens to be made up for analysis were to be preserved with the common tissue preservatives, including embalmer's cavity fluid, and others left unpreserved and allowed to undergo natural putrefaction. Therefore, using stomachs from freshly killed sheep as carriers for the drugs, a series of 4-ounce wide-mouthed bottles were set up, each containing a weighed amount of minced stomach together with a known quantity of one poison and one or no preservative. All bottles were stoppered and sealed with paraffin. In all, enough specimens were arranged so that there were three complete sets of bottles containing the poison in contact with one or no preservative. This permitted during the period of the investigation three quantitative determinations of the poison under every condition considered.

Phenol.—The phenol content of the specimens containing that poison was determined according to the assay method of the United States Pharmacopœia. This is a thoroughly accurate volumetric procedure in which the phenol is transformed into the tribrom compound, the excess bromine taken up by potassium iodide solution, and the liberated iodine titrated with sodium thiosulphate. The results of the analyses are set forth in Table I.

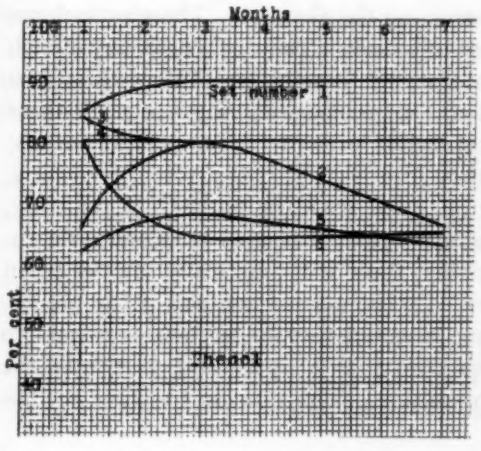

Fig. 1.—Phenol.

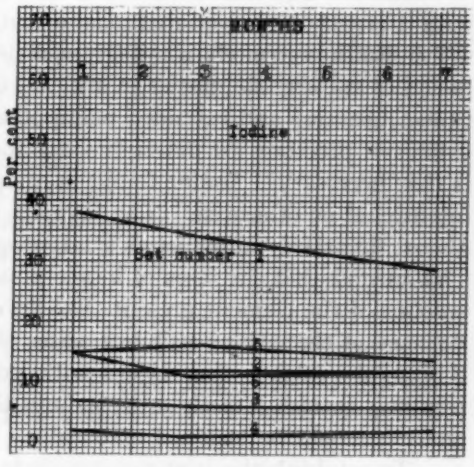

Fig. 2.—Iodine.

TABLE I.—PHENOL.

Set number: Preservative: % found in:	1 Alcohol.	1 HCHO.	3 $HgCl_2$.	4 As_2O_3.	5 Cav. Fld.	6 Unpreserved.
1	85	66	84	80	62	80
2	90	80	80	80	68	64
3	90	67	80	80	63	65

1. Per cent recovered at the end of one month.
2. Per cent recovered at the end of three months.
3. Per cent recovered at the end of seven months.

The data indicates that alcohol is by far the best preservative for samples of viscera containing phenol. A specimen tightly sealed and preserved in alcohol should yield 85 per cent of the acid present in the tissue at the time of death, if analyzed within a year. Bichloride of mercury and arsenous acid cut the decomposition of the poison to approximately half of what it would be in the unpreserved tissue. The two formaldehyde solutions apparently have no effect in the preservation of the phenol contained in the organs. The amount of acid re-

The preservatives used were alcohol, a ten per cent solution of formaldehyde, a one per cent solution of mercuric chloride, a saturated solution of arsenic trioxide, and embalmer's cavity fluid.[1]

[1] The formula for the cavity fluid is approximately as follows:

Absolute alcohol	(Volume)	35.00 per cent
Methyl alcohol	(Volume)	14.70 per cent
Glycerin	(Volume)	2.00 per cent
Ethereal constituents	(Volume)	4.00 per cent
Water and other constituents	(Volume)	44.30 per cent

covered at the end of seven months' contact with them was almost identical with that obtained from the unpreserved tissues (1).

There is some question concerning the formation of phenol within the body during putrefaction. Baumann (2) and Maclawin (3), working independently, have demonstrated the production of some phenol. The amount is so small, however, that it has no toxicological significance.

Iodine.—The increased use of iodine compounds in recent years has brought with it greatly improved methods for determining the element. These procedures will indicate accurately a milligram or less of iodine. They generally begin with fusion of the organic matter in a nickel or platinum crucible and follow through a time-consuming and extended manipulation. Toxicologists now go through these extensive processes to determine the total iodine present. The question arises: is that necessary? Iodine found in quantity in a body is indicative of poisoning, intentional or otherwise. The layman, unfamiliar with the potency of the drug, almost invariably administers a larger quantity than is needed to produce death. This means, that, in cases of iodine poisoning, there will practically always be an amount of the element present that far exceeds the normal content in the tissues. Because of that, the possibility arises that it would usually be necessary only to thoroughly extract the viscera with potassium iodide water and to titrate the resulting extract directly with sodium thiosulfate. The time and technic for the analysis would be lessened materially.

To establish this it was necessary to discover just what per cent of the ingested iodine would combine with the tissue in such a way that it could not be extracted and titrated directly. Preservatives introduce other questions, such as their own combination with the drug and as their probable action in rendering the tissue ineffective as a combining agent to remove the iodine. If the content of free iodine in the organs has a tendency to diminish steadily with age, such a method might be satisfactory provided the organs were analyzed immediately after death, but would fail if the analysis was not conducted until a few weeks later.

To answer these questions the tissue containing the poison was extracted with potassium iodide water until no more iodine was removed. This extract was then titrated for the free element. The results of the determinations are expressed in Table II.

TABLE II.—IODINE.

Set number:	1	2	3	4	5	6
Preservative:	Alcohol.	HCHO.	$HgCl_2$.	As_2O_3.	Cav. Fld.	Unpreserved.
% found in:						
1	38	12	7	2	15	15
2	34	12	6	1	16	11
3	29	12	7	2	14	12

1. Per cent recovered at the end of one month.
2. Per cent recovered at the end of three months.
3. Per cent recovered at the end of seven months.

The results of the analyses show that any loss of iodine through organic or inorganic combination with tissue or preservative, except in the case of tissue preserved with alcohol, occurs immediately. It always includes the major portion of the iodine ingested. Time is no element in the disappearance if the organs are kept sealed to prevent volatilization of the halogen. The content of free element re-

mains constant after the first decrease. Arsenic trioxide and mercuric bichloride are poor preserving agents to employ as they immediately react with the iodine until one or the other is completely used up. Alcohol is the best preservant, with cavity fluid and the 10 per cent formaldehyde solution second and third, respectively. The tissue alone will return as much iodine as that preserved in either of the formaldehyde solutions and, as iodine inhibits putrefaction, if nothing else were available but these two agents it would probably be better to leave the material unpreserved.

It is evident that the toxicologist, by making the preliminary examination as proposed, would be able to tell immediately within 10–15 per cent the quantity of free iodine present in the body at the time of death.

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A COMPREHENSIVE STUDY OF THE PREPARATION OF COLLOIDAL SILVER IODIDE AND A REPORT OF ITS BACTERIOCIDAL AND BACTERIOSTATIC VALUE.*

BY W. A. LOTT AND W. G. CHRISTIANSEN.

It has long been felt desirable to obtain a non-irritating, non-staining germicidal colloidal silver compound to supplant the mild silver-protein compounds which have objectionable staining properties and to supplant the strong silver-protein compounds which produce irritation as well as stains. In fact, colloidal silver halides to which germicidal activity is ascribed have been marketed for some years as germicides. This laboratory has throughout several years conducted a study of colloidal silver iodide made by a great variety of methods. These methods can be indicated briefly as follows:

I Double decompositions.
- *A.* $AgCl + KI \rightleftharpoons AgI + KCl$
- *B.* Ag proteinate + $KI \rightleftharpoons AgI$ + K proteinate
- *C.* Ag soap + $KI \rightleftharpoons AgI$ + K soap
- *D.* $Ag_2O\text{-}(H_2O)_4 + KI \rightleftharpoons AgI + KOH$

II Oxidation and reduction.
- *A.* $Ag^\circ + I^\circ \rightleftharpoons AgI$

III Decomposition of double salt.
- *A.* $KAgI_2 \rightleftharpoons KI - AgI$

With each method a very thorough study was made of the effect of varying the conditions during every step in the method on the colloidality and germicidal behavior of the silver iodide.

These conditions themselves seem endless in variability, and no attempt will be made to discuss them all, but it might be pointed out that significantly different effects are obtainable by altering the (1) kind of protective protein, (2) the degree of hydrolysis of this protein, (3) p_H of the protein during the several

* Scientific Section, A. PH. A., Miami meeting, 1931.

steps in preparation, (4) concentration of electrolytes during and after the formation of the AgI, (5) which of the two reactants in the double decompositions is present in excess, and in what concentration, (6) method and degree of removal of electrolytes after the formation of AgI, (7) temperature of drying.

On account of the difficulty it caused during the early part of the work, it seems desirable to discuss the question of discoloration of the AgI colloids by light, and the control of this phenomenon. The brown color developed in the light sensitive products was due, of course, to the reduction of silver to the metallic state. It was felt at the outset that this could be controlled by keeping the concentration of hydroxyl-ions (OH^-), and silver ions (Ag^+) low. This was confirmed by all the facts later developed. For example: The addition of a small amount of acetic acid to a light sensitive product made it stable to light because of the decrease of the hydroxyl-ion concentration. The addition of moderate amounts of ammonia stabilized a product, probably by the decrease of the silver-ion concentration by the formation of the $Ag(NH_3)^+$ complex ion, and possibly also by decreasing the hydroxyl-ion concentration. A product already turned brown could be made yellow or white by the addition of sufficient iodine to oxidize metallic silver to silver iodide. A product which has been precipitated out of water solution by ordinary denatured alcohol tended to be less sensitive to light than one which was precipitated by isopropyl alcohol. This is explained by the fact that potassium or sodium hydroxides are insoluble in isopropyl alcohol and therefore much less soluble in somewhat diluted isopropyl alcohol than in equally diluted denatured alcohol; therefore when isopropyl alcohol is used the fixed alkali will tend to remain in the gelatinous product. This, of course, would make the solution of the redissolved material higher in hydroxyl-ion concentration and more light sensitive.

Practically then, the conversion to AgI must be carried out completely and when this conversion is completed the hydroxyl ion must be low. In the double decomposition this is accomplished by using mixtures of KI and I_2, the quantity of I_2 being determined by the amount of fixed alkali in the solution which must be neutralized. In the oxidation-reduction method we must be sure that there is not too much fixed alkali present for the conversion to AgI and that the oxidation is really completed. This is determined by the golden-yellow color of the product at the end-point.

EXPERIMENTAL PART.

I. Preparation by Means of Decomposition of Potassium Argento Iodide.—(*a*) This was first accomplished by stirring 11.6 Gm. of Ag_2O with 12.7 Gm. I_2 and 18 Gm. of KI in a solution of 40 Gm. of hydrolyzed, dialyzed and desiccated gelatin and 15 cc. water until the mixture became clear. This preparation was dried to transparent flakes at room temperature in vacuum. The redispersion was not rapid, and gave rise to a milky, not entirely stable colloidal solution.

(*b*) Better results were obtained by mixing 25.8 Gm. AgI and 18 Gm. KI in 129 Gm. of a solvent made by dissolving 48 Gm. of hydrolysed, dialysed and desiccated gelatin in 120 Gm. of diethylene glycol. This gave a clear liquid product which was a true solution of $KAgI_2$. When diluted with water it was rapidly redispersed to a fine, stable colloidal solution of AgI.

(*c*) By dissolving 10 Gm. of AgI and 7 Gm. of KI in 90 Gm. of diethylene glycol, a clear non-hygroscopic solution of $KAgI_2$ was obtained, which gave a stable colloidal solution of AgI when mixed with water.

II. Methods Depending upon Double Decompositions between KI and Various Colloidal Silver Salts.—It was found empirically that very highly dispersed AgI was obtained by the gradual addition of KI to colloidal solutions of only slight soluble silver salts. The explanation for this undoubtedly lies in the slight concentration of electrolytes present during the conversion to the AgI.

(*a*) *Double Decomposition between KI and Silver Proteinate*—360 Gm. of gelatin were hydrolysed in 825 cc. of water with 25 Gm. of 44% KOH by boiling one-half hour. Ten Gm. of phenol (which is later removed) was added, and the solution filtered with suction, a small quantity of Kieselguhr being added to assist filtration; 85 Gm. of $AgNO_3$ in 250 cc. water were added gradually, with efficient mechanical agitation. The silver proteinate was precipitated with two liters of denatured alcohol and dehydrated by disintegrating in two liters of a 1:1 mixture of acetone and methyl alcohol, whereby a light yellow powder was obtained. This was dried at room temperature *in vacuo*. The dry silver proteinate was not repeptized in 500 cc. water and agitated, while 80 Gm. of KI and 15 Gm. I_2 in 250 cc. water were added dropwise. A golden-yellow transparent solution of colloidal AgI resulted, which was precipitated with one gallon of No. 1 special denatured alcohol, and the sticky precipitate dried *in vacuo* at 80° C. A fine looking yellow flaky product resulted, which repeptized readily to a yellow transparent solution. The solid product contained about 26% AgI.

(*b*) *Double Decomposition between KI and Colloidal AgCl.*—One hundred thirteen Gm. of gelatin were hydrolysed in 200 cc. water with 45 cc. of aqueous caustic soda containing 0.1 Gm NaOH per cc., 4 Gm. of phenol were added. After boiling $^1/_2$ hour the preparation was filtered as previously described. A solution of 34 Gm. $AgNO_3$ in 40 cc. water and a solution of 13 Gm. NaCl in 40 cc. water were added dropwise, simultaneously to the agitated gelatin solution keeping the chloride slightly ahead.

Fifty-one Gm. of I_2 were now dissolved in 160 cc. aqueous sodium hydroxide containing 0.1 Gm. NaOH per cc. and 20 cc. water. This solution was now added dropwise to the above colloidal silver chloride solution, while agitating. A liter of 95% alcohol and 365 cc. ether was used to precipitate the colloid. After drying it was redispersed readily in water, giving a milky, stable colloidal solution.

Other modifications of this method wherein KI was used for the formation of the AgI and in which less excess iodide was used gave approximately the same result.

(*c*) *Double Decomposition between KI and Silver Soap.*—One hundred seventy Gm. of $AgNO_3$ were dissolved in 4 liters of water. To this was added, gradually, a solution made by neutralizing 150 Gm. of double distilled cocoanut oil fatty acids with 40 Gm. 33% NaOH in 4 liters of water. The silver soap, made in this manner, precipitates in a granular condition and can easily be washed free of electrolytes on a suction filter.

Four hundred Gm. gelatin were hydrolysed in 1500 cc. water with 50 Gm. of 44% KOH by boiling 35 minutes; 20 Gm. of phenol were added, and the solution filtered.

The silver soap was dispersed in the gelatin solution by a "lightnin" agitator with the beater attachment. The conversion to AgI was accomplished by adding a solution of 170 Gm. KI and 20 Gm. I_2 in 1250 cc. water, dropwise, while agitating. A slight excess of the iodine solution must be added after the golden-yellow end-point is reached in order to insure light stability.

The colloid was precipitated by 15 liters of No. 1 denatured alcohol. Thorough washing with alcohol or reprecipitating with alcohol was necessary to remove the soap formed as a by-product. After drying *in vacuo* at about 80° C. a fine looking yellow flaky product was obtained, which repeptized readily in water to give a translucent white stable solution. The solid material averaged 30% AgI.

A number of other silver soaps were used, but the cocoanut oil soap gave the best results, especially from the standpoint of color and general appearance of the final product.

(*d*) *Double Decomposition between KI and Colloidal Silver Oxide.*—Fifty Gm. of gelatin were hydrolysed in 200 cc. water with 10 Gm. 40% KOH by boiling 30 minutes. After filtering the solution as usual, 17 Gm. of $AgNO_3$ in 50 cc. water were added dropwise, with agitation. The colloidal Ag_2O was formed by adding, dropwise, 5.6 Gm. of KOH in 50 cc. water. After the solution had been dialysed 24 hours at about 50° C., 12.7 Gm. of freshly precipitated iodine was now added and the mixture agitated until the solution became golden yellow in color, indicating that the conversion to AgI was complete. On some occasions, when an excess of I_2 was added, the solution became somewhat red, after the golden-yellow color had been reached. If this is allowed to go too far the solution becomes acid and the ultimate product will not be soluble in water.

After the characteristic yellow end-point was reached, the solution was immediately filtered to prevent further solution of iodine and the reaction mixture was evaporated *in vacuo* at about 80° C. Sometimes alcohol precipitation of the colloid was resorted to in order to get rid of most of the water.

The colloid repeptized to give a transparent solution which soon became opaque and some of the AgI settled out. If the colloidal silver iodide is not dialysed the repeptized product gives a somewhat milky solution, but shows no settling. No satisfactory explanation of the difference in stability has been worked out.

The solid product usually contained about 30% AgI.

III. Oxidation of Colloidal Silver by Elementary Iodine.—Seventeen hundred Gm. of gelatin in 5 liters of water were hydrolysed with 150 Gm. 43% KOH by boiling 37½ minutes, bringing the finished solution back to its original weight with water. It was now filtered with the aid of Kieselguhr and centrifuged in a Sharples Supercentrifuge. Three hundred forty Gm. of $AgNO_3$ in 1500 cc. water were added dropwise (agitation) and converted to the oxide with 233 Gm. of 40% KOH. An additional 233 Gm. of 48% KOH were added and, while continuing the agitation, 250 Gm. of dextrose were dumped into the solution. In a few minutes the light colored solution suddenly became jet black, indicating that reduction to colloidal metallic silver had taken place. The colloidal silver solution was dialysed 24 hours at about 50° C. and sometimes, again centrifuged. The volume was decreased to six liters in a vacuum still and the colloidal Ag converted to AgI by agitating it with 300 Gm. of iodine. If a slight excess of iodine is dissolved the solution becomes somewhat red, but if the quantity of excess io-

dine is not more than slight, this was not detrimental. The colloid was now precipitated by 5 gallons of No. 1 denatured alcohol and dried at about 80° C. *in vacuo*.

The product was a fine looking yellow flaky solid which repeptized readily in water to give a transparent light golden-yellow solution, which was perfectly stable. The solution material usually contained about 30% AgI.

When the usual laboratory germicidal tests were made using both *B. Typhosus* and *Staph. Aureus*, variable results were obtained and in some instances the results appeared to indicate very high germicidal activity. However, a careful study of the ordinary germicidal test indicated that it is of very little value when applied to colloidal silver iodide, and an elaboration of the test showed that in those instances when the bacteria had apparently been killed, the bacteria had not been killed and that the original results were incorrect due to the limitations of the ordinary germicidal test. A careful study of the germicidal properties of all of our experimental samples of colloidal silver iodide of all purchased colloidal silver iodides proved that they are not germicidal and have little if any antiseptic activity when tested *in vitro* against *B. Typhosus* and *Staph. Aureus*.

Therefore, laboratory results fail to disclose any indications of useful antiseptic or germicidal properties in colloidal silver iodide.

The germicidal studies and tests were made by Dr. George F. Leonard in the Biological Research Laboratories of E. R. Squibb & Sons, and Dr. Leonard has discussed the limitations of the germicidal test as applied to silver preparations in a separate publication. (*Journal of Infectious Diseases*, 48 (1931), 358.)

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THE VITAMIN POTENCY OF VARIOUS GRADES OF COD LIVER OIL.*

BY W. S. JONES AND W. G. CHRISTIANSEN.

With the growing use of cod liver oil for animal husbandry purposes, knowledge of the vitamin activity of the various grades of cod liver oils commonly used for such purpose becomes important. These oils are from various grades of cod livers which become available in practice. Some oil is also obtained from pressing liver tissue or "chum," the residue left in steaming of fresh livers for the production of medicinal oil.

Five grades of cod liver oil seemed worthy of study in considering the above problem:

1. *No. 1 Medicinal Oil.*—Oil rendered from fresh cod livers by means of direct steam and skimmed off the settled mass within a short time after steaming (control oil to eliminate the natural variations in vitamin values existing in cod liver oil at different seasons and from different sources).

2. *Second Grade Oil.*—Oil skimmed off after the mass has stood twelve hours subsequent to the first skimming.

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* Scientific Section, A. PH. A., Miami meeting, 1931.

3. *Poultry Oil.*—Oil obtained by the pressing in bags of the liver tissue, "Chum," left after the above two skimmings. The color and free fatty acid content of this oil varies according to the speed and care used in its production.

4. *Poultry Oil.*—Oil rendered by direct steam from livers which have stood some twelve to twenty-four hours after removal from fish, and for this reason yield a grade of oil not suitable for human consumption (off color and taste).

5. *Common Cod Oil.*—Oil from livers which cannot be steamed satisfactorily and which are allowed to rot exposed to air and sun. Oil slowly comes to the top and is skimmed off over a period of weeks. This oil is sometimes used for animal feeding but is generally very high (10–15%) in free fatty acids, red in color and used mostly for industrial purposes.

In view of the fact that any one grade of cod liver oil may vary in vitamin activity from year to year and even for shorter periods, it was considered advisable for comparison purposes to prepare the several grades of oil from one lot of livers.

A day's receipt of fresh livers at one of our rendering plants was mixed, divided into five portions and treated or aged so as to make possible the production of oils as indicated above.

No. 1 medicinal cod liver oil was protected from air during the entire process of straining, settling, skimming, filtering and bottling. Second grade oil was protected to the extent that the cover was kept on the cooker during the time of settling, it was filtered and sealed in the absence of air. Poultry oil produced as described under "3" above is exposed in thin layers on the surface of the bags as it is forced out and flows into a settling tank, and hence suffers more from oxidation than the former. Common cod oil, by nature of the process used in its production, also suffers considerable exposure.

RESULTS.

The preliminary work dealt only with the first three grades of oil. Their assay appears in Table I.

TABLE I.—VITAMIN A AND D ASSAY.

Class of Oil.	Vitamin A Assay U. S. P.	Vitamin D Assay Squibb Unit.
1	Close to 500	>17 < 25
2	Close to 500	Close to 25
3	333 close to 400	Close to 33

The preliminary vitamin A assay indicated that 1 was more active than 2, but final tests indicated only a slight difference. As would be expected from the great exposure, the vitamin A activity of 3 is the lowest, but hardly as low as would be anticipated.

It will be observed from Table I that the vitamin D content of the lower grades of oil is higher than for the medicinal grade of oil. In view of the fact the work was done during the earlier stages of the development of the vitamin D test, it was thought that the results might be incorrect, hence the work was repeated; including the preparation of oils in classes four and five. The results appear in Table II.

The free fatty acid increases with exposure.

The vitamin A activity of these oils follows much the same order as that in Table I, except that the oil expressed from "chum" (class No. 3) gave higher value than anticipated. The vitamin A activity of this oil, would undoubtedly

vary depending on the care taken in its manufacture, however, not to the extent before indicated. Table I represents, it is believed, more nearly the situation.

TABLE II.—VITAMIN A AND D ASSAY OF VARIOUS GRADES OF COD LIVER OIL.

Oil Prepared September 1927.

Class of Oil.	Vitamin A Assay U. S. P.	Vitamin D Assay Squibb.	Free Fatty Acid.
1. No. 1 Medicinal	Close to 700	>20 <33	0.3%
2. 2nd Medicinal	Close to 667	>20 <33	0.4
3. Poultry Oil	More than 667	About 16	5.8
4. Poultry Oil	>500 <667	Close to 20	1.95
5. Common Cod Oil	>400 <500	Close to 16.7	7.7

The vitamin D activity of the oils in Table II also indicates its destruction by exposure.

Classes 3 and 5 show the lowest activity and are the oils, which as observed in their preparation, are exposed longest to air and water.

SUMMARY.

1. The short exposure of oil to water and air before skimming, has a slight deleterious effect upon the vitamin A activity.

2. The long exposure of oil to water, and air as in the case of pressing chum has a marked deleterious effect on the vitamin A activity.

3. The standing of livers for twelve hours or longer before steaming has a marked deleterious effect on the vitamin A activity of the oil obtained.

4. Rotting livers produces an oil of low vitamin A and D activity.

5. Under best conditions for vitamin D test, the indications are that vitamin D is destroyed in cod liver when cod liver oil is exposed to water and air.

The vitamin A and D tests were carried out by the Biological Research Laboratory, E. R. Squibb & Sons, New Brunswick, New Jersey.

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QUALITY OF SPEARMINT OIL PRODUCED IN FLORIDA.*,[1]

B. V. CHRISTENSEN AND LOVELL D. HINER.

The cultivation of spearmint (*Mentha spicata* L.) has not until recently been developed into an industry of much importance. The reason for this is probably due to the fact that in nearly every country of the earth it has been possible to find spearmint being grown in the home garden for home use. This situation prevailed for many years in the United States where it has been used for culinary purposes and for flavoring drinks and to some extent in pharmaceutical preparations. This situation resulted in a very poor market for the herb or its oil so that it has never become of much importance until the past few years, when American industries created a good demand for the oil. As a result some of the growers

* Produced in Medicinal Plant Garden, University of Florida.

[1] Scientific Section, A. PH. A., Miami meeting, 1931.

formerly engaged in the production of peppermint have now turned to the cultivation of spearmint. At present Michigan and Indiana produce practically all of the spearmint oil used in the United States.

During the experimentation with mints, that has been carried on under federal supervision, very little attention has been given to growing spearmint. Bulletins on mint farming barely mention spearmint but devote considerable space to the heretofore more profitable peppermint. Data in the literature concerning production of spearmint or quality of spearmint oils is very meager; neither have there been any attempts, until recently, to determine where spearmint might best be grown.

In view of the considerations stated above, the question arose as to the possibilities of production of spearmint in Florida. This problem involved such phases as (1) yield of green material, (2) yield of oil, (3) quality of oil.

DATA.

Rootstock for propagation was obtained from the Bureau of Plant Industry, Washington, D. C., and planted in the Medicinal Plant Garden during the summer of 1928. Since only a few roots were received, not enough material to work with was obtained the first season. In the spring of 1929, the roots from the original planting were spread out over a larger area and since that time two crops per season have been harvested.

TABLE I.—SHOWING QUALITY AND YIELD OF OIL.

Year.	Time Harvested.	Tons of Green Herb per Acre.	% Yield of Oil.	Pounds of Oil per Acre.	Sp. G. at 25° C.	Ref. Index at 20° C.	Opt. Rot. at 25° C.	Carvone Assay.
1929	June 26 and 27	5.78	0.590	63.14	0.9232	1.4897	−57.491	70%
1929	Oct. 11	1.40	0.164	4.6	0.9215	1.4859	−59.075	*80.2%
1930	July 10	3.97	0.437	34.7	0.9241	1.4825	−56.09	69.5%
1930	Oct. 11	2.318	0.399	18.5	0.9253	1.4837	−56.99	71%

Color of oil—nice yellow. Solubility in 80% alcohol—1 volume.

* See text on content of October yield.

DISCUSSION.

The variations in yield are likely due to seasonal differences and quality of soil. For example, the season of 1929 was characterized by an early spring with plenty of rainfall, but a dry fall. The season of 1930 was almost opposite in that the spring was late and very dry but a fall period with average rainfall. The crop of 1930 was grown on a new plot, not as fertile as that used in 1929. The poor yield for the fall crop of 1929 was undoubtedly due to the dry fall which considerably delayed growth as well, hence, the long period between harvests for that season. This long period of growth would also account for the low yield of oil and the unusually high carvone content of the fall crop of 1929.

Yield of Green Material.—Two to three tons of herb per acre each year is the average yield in the spearmint sections of Michigan and Indiana, this, of course, being obtained from a single harvest, usually in August. In Florida two cuttings each year have been obtained with a total yield in 1929 of 7.18 tons and in 1930 of 6.29 tons per acre or about twice as much per acre as is obtained in the present spearmint sections of U. S.

Yield of Oil.—According to Finnemore "The Essential Oils," page 793 and Gildemeister & Hoffmann, "The Volatile Oils," 2nd Edition, Vol. III, page 533, 20 pounds of oil per acre is considered an average yield. Referring to Table I, the total yield of oil per acre for the season of 1929 was 67.74 lbs. and for 1930, 53.2 lbs. which is about three times as large as the average.

Quality of Oil.—The most noticeable points of interest are the relatively high percentage of carvone present, and the high optical rotation. The 80% carvone content for the October oil of 1929 is very outstanding. A careful survey of the literature has failed to reveal any data on spearmint oil with a carvone content approaching this figure. Finnemore, page 797, gives the maximum range as varying from 61 to 72%, while Schimmel & Co., Reports 1927, give the range as varying from 42 to 60% of carvone. With the exception of this particular crop, the Florida spearmint oils fall within the range stated by Finnemore.

In regard to the optical rotations, it is to be noted they are slightly high as compared to the U. S. P. X range. The fact that the oil which contained the 80% carvone also had the highest optical rotation suggests that the high carvone contents of all these oils were responsible. That the opposite is true is shown by Finnemore, page 797, wherein he mentions oils containing 5 to 10% carvone having an optical rotation as low as —24°. The figures for optical rotation, as shown in Table I, indicate that the range of rotation in the U. S. P. should be modified. It is to be noted that in U. S. P. X the range was increased to —56° as compared to —55° in U. S. P. IX, probably because oils had subsequently been analyzed and found to have a higher optical rotation than the U. S. P. IX limit, due to high carvone content. This should be raised in the next edition of the U. S. P. to at least —59°. The lower limit should also be raised to at least —48°. It is claimed that dealers do not consider spearmint oil with a rotation under —48°. It is suggested therefore, that the next edition of the U. S. P. specify for spearmint oil an optical rotation from —48° to —59° in a 100-mm. tube at 25° C. It is further suggested that a standard of not less than 50% of carvone be adopted by U. S. P. XI.

FATAL IODINE INTOXICATION.

J. J. Eller and E. C. Cox (*Arch. Derm. and Syph.*, 1931, 745, through *Brit. Med. J. Epit.*, 1932, Jan. 16, 12) report a fatal case of iododerma in a man aged 31. The eruption commenced a few weeks after the administration of potassium iodide had been begun, the patient dying from profound iodide intoxication four months later. Large quantities of iodides were found in the urine during the month preceding death, and, at the post-mortem examination, in the skin, liver and kidneys. For four months he had received three doses daily of potassium iodide 5 grains with arsenic 1/60th grain. Various therapeutic measures, such as intravenous injections of saline solution, blood transfusion, sodium thiosulphate and the administration of glucose, were ineffective. It is suggested that by the ingestion of iodized salt for some years, the patient had become so sensitized as to develop a fatal iododerma after taking a tonic containing potassium iodide. Since there are other recorded cases of eruptions following the use of iodized salt, the authors conclude that the public should be warned against its indiscriminate use.—From—*The Pharmaceutical Journal and Pharmacist.*

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DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor will also undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

ADVERTISING AND SELLING PROBLEMS IN DRUG STORES.

Planning an Advertising Campaign.

The purpose of advertising is to create desire. In so far as retail drug stores are concerned, the purpose of advertising is to create, among customers and prospective customers, the desire to purchase the services and merchandise they have for sale. Stated in another way, this means that successful advertisements of drug stores must make the possession of the services and merchandise these stores have for sale seem more desirable than the money these services and merchandise cost.

Desire can be created in drug stores by personal salesmanship and by displays in the store and in the windows. Personal salesmanship in drug stores will be the subject of later articles in this series.

Creation and installation of displays which create desire was the subject of a series of nine articles of mine which appeared in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION from August 1927 to April 1928.

The title of these articles is, "The Psychology of Effective Display." The use of the word "psychology" in that title should not frighten anybody. To many people psychology is a formidable and mysterious word. It should not have any such connotation. Psychology is the study of peoples' behavior. The late Dr. George A. Dorsey made a great contribution to the popular understanding of psychology in his book, "Why We Behave Like Human Beings."

What I tried to do in this series of articles on the Psychology of Effective Display was to take the recognized and accepted facts and principles about human behavior and indicate, with definite examples, the effective use of these principles and facts in the construction of displays which create desire for the merchandise and services shown. It is my sincere belief that a study of these facts and principles, as set down in this series of articles, will prove helpful to any druggist who wants to make the time, money and effort he puts into displays produce the greatest possible return for him.

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* Lecturer on Business, Columbia University and Philadelphia College of Pharmacy and Science.

It is obvious, of course, that displays in a drug store and in its windows can influence directly only those people who enter the store or at least pass by it. It is necessary for many drug stores, particularly those located in communities of small size which draw their patronage from wide areas, to use additional means in order to create the desire among these people to visit their stores or visit them more often.

This involves necessarily the consideration of the external advertising media which can be successfully employed. Before beginning such a discussion, it is of the utmost importance to recognize immediately that the foundation of any successful attempts to create desire for services and merchandise sold in drug stores must be based upon honest services and fairly priced merchandise. Otherwise, continued efforts to advertise and create desire are built upon a wobbly and uncertain foundation which, sooner or later, must fail.

For drug stores located in the busiest shopping centers of the cities they serve, newspapers have proved, frequently, to be profitable means of advertising. This is especially true in communities under 25,000 population if these communities are served by daily, semi-weekly or weekly local newspapers which are carefully read and highly regarded.

The existence of such newspapers is not an assurance, however, that a drug store always can employ space in them for profitable advertising. The situation is analogous to a vacant lot in a desirable business center. The vacant lot merely presents an opportunity for profit. To realize this profit, it is necessary to erect upon the lot an improvement in the form of a store building suitable for the type of retail business to be conducted there.

Space in a widely read and highly regarded local newspaper is exactly similar in its value. The space itself has potential value but this value can be realized only when that space is effectively used to create desire for the services and merchandise described in the space.

This is a point which, regrettably, is frequently overlooked. I have seen in October in country weeklies advertisements of drug stores still hopefully proclaiming that now is the time to think about spring housecleaning.

Obviously such advertisers have not only failed to take fullest advantage of the opportunities created by newspaper space but, actually, by inappropriate advertising, have created the impression that the stores themselves are not alert and certainly are carelessly managed or such untimely advertising would not be used to represent them.

Successful newspaper advertising should not be undertaken without a definite and complete program carefully worked out in all its details in advance of the appearance of the first advertisement.

One of the greatest values that newspaper advertising can have results from its accumulative effects, just as one of the greatest values a drug store itself can have results from the accumulated good will expressing itself in the continued and satisfied patronage of a large number of customers.

To obtain this accumulative advantage of continuous advertising, it is necessary, therefore, for a complete program of advertisements to be planned in advance.

One of the most common forms of drug store advertising, although certainly not one of the most suitable or desirable, is the blatant announcement of greatly reduced prices on popular merchandise. The reason that advertising of this kind

is not as effective as other kinds of advertising is that it lacks originality. Every other store which sells similar merchandise can do the same thing.

Newspaper advertisements of cut prices, just as cut prices themselves, are widely used because this is a method of advertising which requires very little care and thought in its preparation. This apparent advantage is also its weakness, as I have indicated above, because the ease with which such an advertising plan can be initiated also means that the plan can be easily copied.

Advertisements which are distinctive and original are harder to plan but, once planned and executed, have far more selling power because of their originality and the difficulty with which they are successfully imitated. The difficulty of imitating them results, in considerable part, from the unwillingness of most competitors to devote to newspaper advertising any considerable amount of thought and care.

As I have said repeatedly in this series of articles, the one thing that distinguishes a drug store from all other stores is the fact that it is equipped and able to render professional services which no other retail store is licensed to perform.

Therefore if newspaper advertisements, based upon this distinctive feature of drug store service, are planned they are not and cannot be readily copied by all the many types of competitors drug stores face to-day.

Most druggists recognize this exclusive advantage of theirs. The problem is the effective statement of this advantage in newspaper advertisements.

All too often the execution results in an advertisement which is built around the familiar theme—"Prescriptions Carefully Compounded." Such a fact is taken for granted by drug store customers. *To advertise it really is dangerous because the inference is that prescriptions sometimes aren't carefully compounded.*

The same thing is true of another statement often made—"Prescription-filling is the most important part of our business." Even worse, is the statement—"No substitution here. You get exactly what your doctor ordered."

The successful advertisement of personal services of a drug store has, therefore, to be considerably more original than the worn and dangerous phraseology quoted above.

The most successful advertisements of this kind that I have seen are advertisements which steadily but surely impress upon customers and prospective customers the services of pharmacy in conserving and protecting public health.

Advertisements of this kind, if properly and carefully worded, emphasize, for instance, the importance of the wider use of the Schick test to determine whether or not children are immune from diphtheria. It is easy to see that an advertisement of this kind may be a distinct contribution to public health and safety. At the same time any pharmacist readily can see that such advertising is bound to create interest and good will among physicians and other professional people. It even is likely to result in increased sales by him of the serums necessary for the test.

The Dick test for scarlet fever furnishes an immediate interesting and profitable subject for newspaper advertisements of pharmacies. Other suitable subjects are the dangers of promiscuous use of laxatives and headache remedies. Certainly a rational advertisement which names a large number of the internal conditions of which persistent headache is the symptom, is a decided contribution to public health.

Other fields in which productive drug store advertisements can be written are insecticides and rodent poisons, veterinary medicine, including such subjects as pets, poultry and farm animals, horticultural supplies and other preparations for home and farm use.

The writing of advertisements for newspapers is a subject which requires considerable technical skill. Not all druggists have this skill. The remedy that is sometimes suggested is for a druggist, not personally experienced in advertisement writing, to hire somebody to do it for him. Theoretically, it is a good idea. Practically this idea doesn't work well in the preparation of drug store advertisements and this is the reason.

Experience has proved that it is unprofitable for a drug store to spend more than one and certainly no more than two per cent of its receipts for advertising. In a drug store with sales of $25,000 a year, an appropriation of one per cent of its receipts for advertising thus would be $250, or about $20 a month. In other words, such a druggist has available to spend for all the costs of advertising, including the cost of the newspaper space and any incidental costs, a maximum of about $20 a month. With four to twelve advertisements to prepare each month, it is manifestly impossible for a druggist to pay any competent person to write these advertisements for him and still keep the total costs of advertising within the limits indicated above.

That is why the problem of preparing productive newspaper advertisements rests upon the drug store proprietor himself. As a matter of fact, any druggist who can talk convincingly, can train himself to write advertisements which carry equal conviction. In later articles in this series, I plan to name and explain the most important technical problems in the preparation of productive drug store advertisements.

What I have been trying to emphasize in this article, with respect to newspaper advertising, is the necessity for the development of a continuous program of such advertising and the outlining of a series of suitable subjects in the execution of this program.

Sources of material for advertisements of the type which I have suggested above are obtainable, without cost, or at very small cost, from many of the life insurance companies, from state and local departments of public health and from the federal government. Departments of the federal government which distribute free, or at small cost, material about subjects suitable for use in drug store advertisements, include the United States Public Health Service, the United States Department of Agriculture and the United States Department of Commerce.

Another group of subjects for drug store newspaper advertisements is the announcement of new and unusual merchandise and services. Here the source of facts for use in the advertisements arises inevitably from the purchase of the merchandise. All the druggist needs to do in considering what he should say about new merchandise and services is to ask himself this question—Why did I buy this merchandise, or why am I installing this service? An answer to these questions inevitably must produce facts which can be used in the writing of productive advertisements about these new services and merchandise.

For instance, if a pharmacist decides to open a clinical laboratory for blood, urine and other analyses, his answers to the question—Why have I opened this

laboratory, must provide the subject matter for suitable advertisements, if his plan is sound.

The very familiarity which druggists enjoy with the great variety of substances which are to be found in their stores is apt to lead to the overlooking of interesting and convincing facts about these substances which could be used as subjects for newspaper advertisements. In order to obtain a perspective upon the usefulness, as well as the mystery and romance, which lies behind many of the preparations on drug store shelves, a reading or re-reading is recommended of books and articles on the history and development of pharmacy and related sciences.

Charles H. LaWall's book, "Four Thousand Years of Pharmacy," is an admirable summary of the subject in a form which is directly suggestive of subjects for newspaper advertisements about the services of pharmacy. A recent book edited by John C. Krantz, Jr., "Fighting Disease with Drugs," is packed full of similar stimulating thoughts and ideas.

In the next article in this series, I intend to outline the advantages and limitations of other advertising media which retail druggists can use in an effort to bring customers and prospective customers to their stores. Newspapers are mentioned first because in those instances in which the trading area of a drug store corresponds closely to the distribution of local newspapers, such newspapers have proved many times to be the most productive advertising medium for drug stores.

General view of prescription department Lascoff Pharmacy—looking toward front.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

"The Editor of this Department is endeavoring to group the material presented at the teachers' conferences in Miami into the four divisions, pharmacy, chemistry, materia medica and pharmaceutical economics. The following paper presented to the Conference on Pharmaceutical Economics by Chairman Dr. C. Leonard O'Connell will be of great interest to all teachers of commercial pharmacy. The author will be pleased if the papers bring about some discussion on the important subject of pharmaceutical economics."—C. B. JORDAN.

ADDRESS OF THE CHAIRMAN OF THE CONFERENCE OF TEACHERS OF PHARMACEUTICAL ECONOMICS.

BY C. LEONARD O'CONNELL.*

If Pharmaceutical economics has any hope of unqualified recognition from accredited schools of pharmacy, certain it is, that such recognition must be and should be based upon the value of, as well as necessity for, such training in modern pharmacy.

The traditional pedagogical lifting of the brows at the idea of trade or business in a profession, as well as the snobbish disdain of monetary profit, is fast losing its appeal among those educators, who, while not themselves lovers of money *in se*, are, nevertheless, sensible of its value as a means for professional advancement. It is high time that the reactionary view of those who are more concerned with their preconceived notions of what is good for our calling, than with what is good for it should be subjected to coldly critical analysis of what in the light of the available objective data is actually the best for pharmacy.

Many thoughtful educators are daily confronted by conditions among practicing pharmacists that surely are indicative of sad lacks in our educational procedure. Judging pharmaceutical education by a norm that calls for an education that equips an individual to adapt himself to his environment in its totality, an impartial observer must admit that pharmaceutical educators and schools of pharmacy have fallen far short of this standard. The ordinary student and the graduate, for the most part, are unable to understand the emphasis upon the professional aspect of the field and the almost total neglect of the economic aspect.

Admitting freely, as all honest observers do, that the essential function of the pharmacist is a professional one, yet, when one views the sad lack of knowledge of sound business principles among practicing pharmacists, it would seem advisable to consider a broadening of the function of colleges of pharmacy to include some economic instruction.

The colleges must meet this need of their own volition or, eventually, conditions will make their need so imperative that there will ensue a great danger of an overemphasis upon the economic aspect of our profession. Such an overemphasis would have a very damaging effect upon the future development of pharmacy.

* Associate Dean of Pittsburgh College of Pharmacy.

For these reasons it would seem that teachers in colleges, who have been educated in the profession of pharmacy and who are aware also of the great need for sound instruction in the fundamental economic principles governing the field should set about making a careful study of the problem of the teaching of such subjects in the colleges under the supervision of the colleges of pharmacy.

Such a study should include a consideration of the following:

(1) What to teach?
(2) Why teach what we teach?
(3) How teach what we teach?

The answers to these three questions are to be found, respectively, in the fields of educational sociology, educational philosophy and educational psychology. Particular attention must be given to the foundations of these fields and their relationships to the practicing pharmacist, as well as to the major objectives of the education.

Further, careful study must be given to the functions or primary uses of education which, according to the analysis of Professor Lomax are: (1) *adaptive*, (2) *unifying*, (3) *differentiating* (4) *selective*, (5) *directive*, (6) *participating*, (7) *preparatory*. The problem in the last analysis will be to interpret these functions in the field of pharmaceutical economics.

The question of the problem of subject matter requires a two-fold study of (1) the problem of activity analysis and (2) the problem of subject matter selection and organization. In other words, it must first be determined what men do in the field and then the curriculum or course of study must be based in a large measure upon these findings.

The foregoing, not intended to be complete, but rather suggestive of a way of proceeding to obtain some concrete data upon which to work, is given with the hope that soon a purposive study of the field of pharmaceutical economics will be initiated to the end of demonstrating indisputably its right to inclusion within any complete scheme of pharmaceutical education.

USE OF FLUIDEXTRACTS DURING THE PAST FIFTY YEARS.

BY E. N. GATHERCOAL.

A number of very interesting and valuable reports of surveys made on U. S. P. and N. F. drugs and preparations in prescriptions have been published in the JOURNAL. Recently work has been done in connection with prescription ingredient survey on the extent of use of fluidextracts; a tabulation has been made of the number of times each one occurs in ratio to 10,000 prescriptions. It has been found that in the larger pharmacies the greatest assortment of prescription items is called for and the lesser number of items is called for in the prescriptions of pharmacies where the number of prescriptions is less.

A tabulation has been made of fluidextracts for 10,000 prescriptions showing the number of times various fluidextracts were used in given periods about 1885, 1895, 1908, 1927 and 1931. A list of fluidextracts has also been prepared of about sixty in number, naming those fluidextracts which occur ten or more times in each 10,000 prescriptions.

The surveys which have been made are sources of valuable information from several standpoints, each survey is helpful in revision work. In that connection, of course, it must be taken into consideration that inclusion cannot be entirely dependent upon the extent of use in prescriptions.

TINCTURE AND FLUIDEXTRACT OF DIGITALIS.*

BY L. W. ROWE AND WILBUR L. SCOVILLE.

The most pressing problem connected with preparations of digitalis at the present time is that of securing stability. For some reason, as yet but partially understood, preparations of this drug deteriorate rather rapidly for the first few months, then come to a condition of relative stability and deteriorate much more slowly. The relative rate of change is not uniform either in the initial stage or in the later.

In so potent a drug uncertainty of strength is a serious obstacle, and the stabilizing of its preparations becomes highly important. Fortunately, the establishment of the fact that the activity resides entirely in the glucosides simplifies the problem to a considerable extent.

Since glucosides undergo hydrolysis quite easily and all liquid preparations of digitalis contain water in varying amounts, the first suggestion that occurs is to find some way to prevent hydrolysis.

This action may be due to a hydrolytic enzyme coexisting in the drug which produces the reaction, or it may be due to an inherent instability of the glucoside in the presence of even a small amount of water. Both factors were considered in the following experiments.

In the fall of 1930, fifty pounds of the fresh first-year leaves of *Digitalis purpurea*, grown at the Parkedale farm near Rochester, Mich., were cut and divided into two portions. (The weight here is that of the fresh, undried leaves.) Twenty-five pounds were covered immediately with alcohol, ten gallons of alcohol being used, shipped to the Detroit laboratory in this condition, and on the day after cutting, the mixture was heated to the boiling point of alcohol for half an hour, the object being to destroy any hydrolytic enzyme that might be present in the fresh drug.

The other twenty-five pounds were placed in a vacuum dryer and dried as rapidly as possible to a practically constant weight, at a temperature of about 40° C.

The alcohol, after cooling, was drained from the now sterilized leaves, the leaves pressed, then dried in the vacuum dryer. These leaves dried much more quickly, as was expected, since most of the water had already been displaced by alcohol. The alcoholic liquid recovered measured 35130 cc. (9.28 gals.), tested 74.9% of alcohol by volume, and yielded 1.81% extractive or a total of 634.9 Gm.

The dried (sterilized) leaves weighed 1845 Gm. (4.067 lbs.) to which the extractive from the alcohol solution is added, making a total of 2480 Gm. (or 5.467 lbs.). The alcoholic liquid was then concentrated by distillation *in vacuo* so that 1 cc. would represent 2 Gm. of drug. All preparations made were then prepared by calculation so that the amount of drug used, plus an equivalent of the alcoholic concentrate would represent an equivalent of normal air-dry drug.

Before extraction the drug was defatted by extracting with petroleum ether. The weight, after drying was 1788 Gm. (3.92 lbs.) showing 3.09% of fat extracted.

From the unsterilized leaves there was obtained 2535 Gm. of dry leaves (5.588 lbs.) which after grinding was extracted with petroleum ether and again dried, yielding 2462 Gm. (5.42 lbs.).

* Joint Session of Scientific Section and Practical Pharmacy, A. PH. A., Miami meeting, 1931

We thus from 25 lbs. (11,440 Gm.) of fresh leaves obtained 2462 Gm. of defatted dry powder for extraction in one case, and 1788 Gm. of sterilized defatted powder in the other case, to which is to be added 635 Gm. of extractive taken out by the alcohol used in sterilizing making a total of 2423 Gm. of dry fat-free material.

The powdered leaves were then used in the proportion of 2462:1788::1:0.726 or about three-fourths as much of the sterilized leaves as of the unsterilized, since to the former one cc. of the concentrated alcoholic liquid was added to the product for each 2 Gm. of drug used to restore the extractive previously taken out. From each drug there was then prepared three tinctures and three fluidextracts in the usual manner, using 77% alcohol (alcohol 4 volumes—water 1 volume) as the menstruum.

One tincture from each drug represented the official preparation as now formulated, one was adjusted to a lower p_H, and one was saturated with anhydrous sodium acetate. Each preparation was assayed by the M. L. D. frog method when first made, and again after standing about six months.

The results are as follows:

U. S. P. Tincture of Unsterilized Drug.

p_H = 5.65
Assay, fresh = 300%
Assay, after 5 mos. = 140%
Loss = 53%

U. S. P. Tincture of Sterilized Drug.

p_H = 5.50
Assay, fresh = 125%
Assay, after 5 mos. = 90%
Loss = 28%

Corresponding tinctures to which were added hydrochloric acid.

Unsterilized Drug.

p_H = 4.01
Assay, fresh = 125%
Assay, after 5 mos. = 110%
Loss = 12%

Sterilized Drug.

p_H = 4.00
Assay, fresh = 260%
Assay, after 5 mos. = 175%
Loss = 33%

Corresponding tinctures containing anhydrous sodium acetate and acetic acid.

Unsterilized Drug.

p_H = 5.00
Assay, fresh = 110%
Assay, after 6 mos. = 125%
No loss

Sterilized Drug.

p_H = 4.90
Assay, fresh = 125%
Assay, after 6 mos. = 125%
No loss

The idea of using anhydrous sodium acetate was that it might act by absorption of the water in the menstruum and hinder or prevent hydrolysis of the glucosides. It was found by experiment that when a 77.4% alcohol was saturated with anhydrous sodium acetate the solution contained 5.6 Gm. of the salt in 100 cc. of solution, and had a p_H of 8.2. Since an alkaline reaction in digitalis preparations is detrimental to activity enough glacial acetic acid was also added to bring the p_H to correspond approximately with that of the tinctures containing hydrochloric acid. One hundred and twenty cc. of glacial acetic acid was found to be necessary per 1000 cc. of tincture. This necessitated stopping the percolation at four-fifths the normal yield, since each 100 cc. of tincture contained 6 Gm. of anhydrous sodium acetate and 12 cc. of glacial acetic acid.

The corresponding fluidextracts show the following results:

N. F. Fluidextract from Unsterilized Drug.

p_H = 5.48
Assay, fresh = 80%
Assay, after 6 mos. = 55%
Loss = 30%

N. F. Fluidextract from Sterilized Drug.

p_H = 5.50
Assay, fresh = 115%
Assay, after 6 mos. = 70%
Loss = 40%

N. F. Fluidextract with HCl, Unsterilized.

p_H = 4.01
Assay, fresh = 60%
Assay, after 6 mos. = 60%
No loss

N. F. Fluidextract with HCl, Sterilized.

p_H = 3.85
Assay, fresh = 100%
Assay, after 6 mos. = 60%
Loss 40%

N. F. Fluidextract + Acetic Acid and Acetate, Unsterilized.

p_H = 5.50
Assay, fresh = 50%
Assay, after 6 mos. = 70%
No loss

N. F. Fluidextract + Acetic Acid and Acetate, Sterilized.

p_H = 4.80
Assay, fresh = 100%
Assay, after 6 mos. = 60%
Loss = 40%

Since the sterilization of the fresh leaves by treatment with hot alcohol introduces commercial difficulties which are serious, further experiments were made to ascertain the comparative effect of sterilization on the dried (unsterilized) leaf.

A tincture was prepared as follows: To 100 Gm. of the dried digitalis was added 100 cc. of alcohol (95%), the mixture allowed to stand over night in a stoppered flask, then heated under a reflux condenser in a boiling water-bath for 30 minutes. The mixture was then allowed to cool, 25 cc. of water added and well mixed, again macerated over night, then packed in a percolator and extracted with 77% alcohol until 1000 cc. of tincture was obtained. To half of this tincture or 500 cc. there was added 4 cc. of concentrated hydrochloric acid, to bring the p_H down from 5.43 to 3.99.

Assay, fresh = 250%
Assay, after 6 mos. = 220%
Loss = 12%

To the other 500 cc. was added 1.05 cc. of 50 per cent hypophosphorous acid, which reduced the p_H to 3.95.

Assay, fresh = 275%
Assay, after 6 mos. = 125%
Loss = 52%

Another tincture was made as follows: To 50 Gm. of the dried digitalis was added 50 cc. of 87% alcohol (alcohol 9 vols., water 1 vol.) well mixed and allowed to stand in a stoppered flask over night. This was then heated in a boiling water-bath under a reflux condenser for 15 minutes, cooled, packed in a percolator and after maceration extracted with 87% alcohol to obtain 500 cc. of tincture. To this was added 0.75 cc. of 50% hypophosphorous acid, which produced a p_H of 3.55.

Assay, fresh = 250%
Assay, after 6 mos. = 125%
Loss = 50%

SUMMARY.

Sterilization of the leaves by hot alcohol appears to increase the stability of the tincture. If applied to the undried leaves exposure to hot alcohol vapors would undoubtedly be more practical than maceration in boiling alcohol, but the results indicate that the application of hot alcohol to the dried leaves may be quite as effective and more economical. The results thus far are not at all conclusive and the subject will be continued.

On the fluidextract all results are erratic and no conclusions can be drawn. Undoubtedly the heat and exposure during the concentration of the weak percolate affects the activity to some extent and introduces a factor which cannot be easily controlled. It also opens the question whether the fluidextract is sufficiently reliable to warrant its continuation.

The acidity also appears to be a factor in stability. The addition of hydrochloric acid to secure a p_H of about 4.0 favored stability in three cases out of five. Whether more acid would increase the stability we have yet to learn. Hypophosphorous acid proved to be more of a detriment than a help.

The use of anhydrous sodium acetate as an anti-hydrolytic agent shows some very interesting results. The only preparations which show no loss in six months are those that contain this agent. But there is an unaccountable low initial assay, though all these samples except one of the fluidextract are above the standard. Since these preparations contain about 12 per cent of acetic acid this may impair the accuracy of the assay when injected into the lymph sac of the frog. This question as well as further experiments on the influence of sodium acetate will be followed up. It is planned to continue the investigation with the hope of securing more stable preparations of Digitalis for the next U. S. P. and N. F. Coöperative work on this line is invited from any who may be interested.

We desire to acknowledge with thanks the assistance of Mr. J. A. Sultzaberger who determined the p_H values on all the preparations here listed; also to Dr. Adelia McCrea for assistance in procuring the fresh leaves.

LABORATORY OF PARKE, DAVIS & CO.,
DETROIT, MICH., June 1931.

THE INTERNATIONAL CONGRESS OF PURE AND APPLIED CHEMISTRY.

The Ninth International Congress of Pure and Applied Chemistry will be held in Madrid from April 3rd to 10th. The officers of the Congress are: J. R. Mourelo, *vice-president* of the Academy of Sciences and professor Emeritus of the School of Arts, *honorary president;* O. Fernandez, *professor* at the University of Madrid, member of the Academy of Sciences and dean of the Academy of Pharmacy, *president;* and E. Moles, professor at the university and at the National Institute of Chemistry and Physics and president of the Spanish Society of Chemistry and Physics, *general secretary.*

BOTANICAL SOCIETY OF AMERICA.

Newly elected officers of the Botanical Society of America are: *President,* Dr. George J. Peirce, professor of botany and plant physiology, Stanford University; *Vice-President,* Dr. Arthur J. Eames, professor of botany, Cornell University; *Secretary,* Dr. Sam F. Trelease, professor of botany, Columbia University; editors of the *American Journal of Botany,* Dr. Lester W. Sharp, professor of botany, Cornell University, and Dr. B. M. Duggar, professor of physiological and applied botany, University of Wisconsin.

CORRESPONDENCE

NOTE ON COLOR AND FORM OF "BICHLORIDE TABLETS."

BY E. FULLERTON COOK, CHAIRMAN.

COMMITTEE OF REVISION OF THE U. S. P.

"A few days ago a personal friend of mine in Swarthmore made the tragic error of taking several Bichloride Tablets in mistake for Aspirin. Several weeks before he had been told by his physician to go to the drug store and buy some Bichloride Tablets for use in a wash for a foot inflammation from which he was suffering. He had done this in December and the record shows the purchase of these and its proper registration in the store as for a wash.

"Unfortunately neither the drug store management nor the manufacturer of the tablets seems to have known of the requirements of the Pharmacopœia for these dangerous tablets. Many will doubtless remember, some years ago, of 'almost an epidemic' of similar accidents and nation-wide publicity concerning them. At that time the Pharmacopœia established specifications for these tablets which were intended to prevent their accidental misuse and it was believed that every manufacturer was fully conforming to the spirit of these requirements. However, the tablets sold and accidently taken, in this case, were *white* and *discoid* and while the word POISON was stamped on the tablet in raised letters it could have been easily overlooked, especially as Aspirin tablets also carry a raised lettering.

"I am taking the liberty of sending this letter to manufacturers in this country and to the pharmaceutical press with the appeal to every one selling Bichloride Tablets of the Antiseptic type, no *matter whether they do or do not conform exactly in strength or formula to the tablet now official in the Pharmacopœia*, that they immediately check the essential safety factors and see that in these respects they do conform to the specifications of the U. S. P. which have been in force for the last sixteen years.

"In accordance with the Pharmacopœia, a Poison Tablet of Corrosive Mercuric Chloride (Corrosive Sublimate Tablets or Bichloride Tablets) should be of an angular shape, *not discoid*, each having the word POISON and the skull and cross bone design distinctly stamped upon it. Each tablet weighs about 1 Gm. and contains not less than 0.45 Gm. and not more than 0.55 Gm. of corrosive mercuric chloride ($HgCl_2$), the remainder consisting chiefly of either sodium chloride (NHCl) or ammonium chloride (NH_4Cl). *The tablets are to be colored blue*, preferably with sodium indigotindisulphonate. Poison Tablets of Corrosive Mercuric Chloride are to be dispensed in securely stoppered glass containers on the exterior of which is placed a red label bearing the word POISON and a statement indicating that the Tablets contain the required amount of corrosive mercuric chloride.

"This warning applies to *manufacturers*, *wholesalers* and *retailers* over the entire United States and all distributors should immediately check their stock and withdraw from sale every package which offers a white or discoid tablet.[1]"

PHARMACY IN THE 1933 WORLD'S FAIR.

Chairman H. C. Christensen, of the Pharmacy Committee of the World's Fair, prepared a most interesting report dealing with the 1933 World's Fair. The pharmacy exhibit will depict the educational, scientific and professional progress of pharmacy during the past century; the exhibit will be located in the Hall of Science. The fair officials have allotted a definite space to pharmacy in the Hall of Science, a very choice spot, and the size is about the same as that for the American Medical Association and the American Dental Association for their exhibits, approximately 1500 square feet. There is no charge for this space but pharmacists are obligated to portray in the exhibits the progress of pharmacy during the past century from a non-competitive and professional viewpoint. (Outside of the general display zones there will be competitive displays.) It is evident that pharmacy has been fairly dealt with and the space gives a splendid opportunity for showing the progress of pharmacy, so that the visitors may realize what pharmacy has ac-

[1] I have just learned that death resulted from the Bichloride poisoning referred to. The patient died at the University of Pennsylvania Hospital on Sunday night, February 7th.—E. F. C.

complished. Every pharmacist should lend his efforts and give publicity to make this a worth while exhibit.

Chairman Christensen describes the buildings as far as they have been developed or completed and this shows a definite purpose to go ahead with this great world's fair. He explained an exhibit as an example—by the electrical connection the circulation of the blood is shown, the action of the heart, etc. There will be no "hands off" sign on these exhibits. In that respect it follows the idea of the museum so eminently well organized by Dr. Miller in Germany.

There is no question relative to the exposition—it will be opened on time; at least one hundred contracts have been signed and the opening date has been named as June first, 1933. Thirty-nine out of forty-eight states have appropriated money or appointed official commissions to formulate plans, and quite a number of official acceptances have been received from foreign countries. The completed buildings so far are: The Administration Building, the Travel and Transport Building and the replica of Old Fort Dearborn; and others under construction are The Hall of Science in which the pharmacy exhibit will be housed and the three buildings of the electrical group.

The financial success of the Fair is assured and the undertaking has nothing whatever to do with other conditions that may obtain in Chicago. The unique use of line and color, combined with brilliant illumination at night will create a veritable wonderland. Just as the Chicago World's Fair in 1893 set a new style in American architecture so the 1933 Exposition will create a new school.

The site of the Exposition is along the Lake front and adjoining the Field Museum, the Adler Planetarium, and the Shedd Aquarium. No more ideal spot can be found for the exposition than at this site. The problem of pharmacy is to find a way of financing the exhibit; a number of the national organizations have pledged contributions. Inasmuch as the display will represent all phases of pharmacy a Committee will, in the near future, provide opportunity for all to participate by lending their support and giving their suggestions. Everyone affiliated with pharmacy should use his efforts to make this display representative of pharmacy's accomplishments so that the attention of the world may be attracted to the service of pharmacy.

IOWA STATE DEPARTMENT OF HEALTH, DES MOINES, IOWA.

To the Druggists of Iowa:

During the Forty-Fourth General Assembly, Section 2306 of the Code of Iowa was revised to read as follows:

"*Druggists to keep record of remedies sold.* Every pharmacist or person who sells any proprietary drug, preparation or article of any kind used for the cure or treatment of any general disease, except on physician's order or prescription, shall keep a record of the name, address and sex of each purchaser. A copy of said record shall be mailed each week to the State Department of Health, or to the full-time county or municipal health officer, if such exists within the county."

This Section became a law on July 4, 1931.

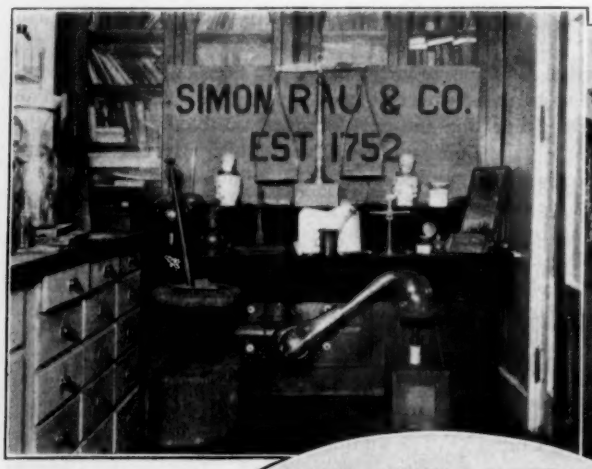
It becomes the duty of the State Department of Health to interest itself in the enforcement of this law. According to the above, druggists are required to report the names and addresses of persons to the State Department of Health, who purchase drugs or appliances for the treatment of venereal diseases.

We recommend that the druggist *exercise his judgment* and record only those cases he believes purchased supplies for the treatment of such diseases. All such cases *must be reported.*

This letter is being written with the knowledge and approval of the State Pharmacy examiners, in order that all druggists in the state may be informed regarding this law and its revision.

We are forwarding herewith blank forms to be used for transmitting the information, as approved by the statute. Your coöperation in this matter is respectfully solicited.

(Signed) D. E. CAMP, M.D., *Deputy Commissioner*
In charge of V. D. Control.



Upper Right and Left.—Views of old laboratory and utensils still to be seen in the pharmacy of Simon Rau & Co., Bethlehem, Pa., established in 1752.

In Oval.—The venerable apotheke and dwelling erected in Bethlehem, Pa., in 1752—the second story in 1764.

"Die Apotheke" was started in the Moravian Clergy House (in 1743) on Church St., Bethlehem, Pa., during the first decade of the town's existence. It was called "Die Apotheke" and was in charge of Dr. Frederic Otto, and after 1750 of his brother, Dr. J. Mathew Otto. A dwelling and drug store, one-storied stone, and a frame laboratory were built for the apothecary and occupied by him in July 1752. (The site of the present drug store.) A second story of frame construction, filled with brick, was added in 1764. The post was held and acceptably filled for 28 years by Timothy Horsfield, Jr., from 1761 until his demise, April 11, 1789.

Dr. J. Eberhard Freytag took charge of the drug store immediately upon his arrival in Bethlehem, January 1790. He purchased the stock and fixtures from the Moravian Congregation in 1796, thenceforward carrying on the business on his own account for 43 years. Then he sold it to Simon Rau, who had been under his tuition since 1830. The venerable pile, dwelling, store and laboratory which had been erected in 1752, were razed by Simon Rau in 1862–1863, and replaced by the more commodious dwelling and store buildings now occupying the same site. His brother, David Rau, was associated with the business from 1866 until his death in January 1879. After that it was conducted by Eugene A. and Robert Rau, under the firm name of Simon Rau & Co., the name under which the business is still being operated.

After the death of Robert Rau in September 1906, his share in the business was bought by C. N. Lochman. E. A. Rau retired in April 1913, and was succeeded by F. P. Miller, who later sold his part of the business to Robert A. Smith, April 1, 1930.

C. N. Lochman, who was connected with the store for over 49 years, died on May 3, 1930. Robert A. Smith, a graduate of the Philadelphia College of Pharmacy, purchased Mr. Lochman's share on June 3, 1930, and thus became sole owner of Simon Rau & Co. In April 1930, Paul B. Clarke, also a graduate of the Philadelphia College of Pharmacy, came with Simon Rau & Co. as registered pharmacist. On the outside of the store is a brass plate which reads "First Bethlehem Pharmacy in Clergy House, 1743–1752. Est. at this stand 1752."—*Merck's Report.*

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1931–1932.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 8.

January 27, 1932.

To the Members of the Council:

71. University of Wisconsin Student Branch. Motion No. 23 (see Council Letter No. 7, page 75) has been carried and the formation of the University of Wisconsin Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and the preamble and by-laws of the Branch, as submitted, are approved.

72. Election of Members. Motion No. 24 (see Council Letter No. 7, page 77) has been carried and applicants numbered 131 to 191 are declared elected.

73. Report of Auditors. The following report has been submitted:

January 25, 1931.

Mr. C. W. Holton, Treasurer,
AMERICAN PHARMACEUTICAL ASSOCIATION.

Dear Sir:

I have made an examination of the books and accounts of the AMERICAN PHARMACEUTICAL ASSOCIATION and your report, as Treasurer, for the calendar year 1931, and *I hereby certify* that the total Cash and Securities on hand at December 31, 1931, amounting to $458,148.28, is correctly stated.

During the year real estate was purchased for the headquarters building account at a cost of $94,901.97 which, together with previous purchases, increases the cost of property owned by the ASSOCIATION to $194,507.37.

All cash receipts have been traced to deposits in bank to the credit of the respective funds for which received, and all disbursements have been found evidenced by properly authorized voucher checks.

Balances on deposit with the various banks have been reconciled with Certificates from the depositories, and Investment Securities held by the ASSOCIATION have been examined and found to be in agreement with accounts shown by the records. All securities owned by the ASSOCIATION and stated in your report in the amount of $420,700.00 are valued at face or par value.

Interest accruing on bonds held by the various trust accounts has been promptly collected on their due dates and deposited to the proper fund account.

Records maintained by the Secretary of the ASSOCIATION have been examined and transfers of funds from his account to that of the Treasurer have been verified.

Respectfully submitted,

(Signed) W. A. JOHNSON,
Certified Public Accountant.

In order that the members of the Council and others interested may be informed, the following data is quoted from the Treasurer's report for the year:

JANUARY 1 TO DECEMBER 31, 1931.

BALANCE AND RECEIPTS.

Balance.

Cash in Merchants & Newark Trust Co., Newark, N. J.	$ 4125.38	
Cash in Boston Penny Savings Bank	353.06	
Total Balance January 1, 1931		$ 4,478.44

Receipts.

For the Current Fund:			
From the Secretary (see account attached)	$38,771.70		
Interest on Deposit, Boston Penny Savings Bank	16.25		
Interest on Deposit, Merchants and Newark Trust Co.	19.00		
Interest on Headquarters Building Fund	9,534.51		
Total Receipts for the Current Fund		$48,341.46	
For the Permanent Funds:			
Endowment	$ 558.31		
Centennial	193.78		
Ebert Legacy	292.44		
Ebert Prize	42.50		
Life Membership	1,694.21		
Endowed Membership	125.00		
Research	2,589.91		
Headquarters Building	18,606.51		
Total Receipts for the Permanent Funds		24,102.66	
For the Trust Funds:			
Wm. Procter, Jr., Monument	$ 595.23		
J. P. Remington Honor Medal	49.25		
Total Receipts for the Trust Funds		$ 644.48	
Total Receipts			$ 73,088.60
Total Balance and Receipts			$ 77,567.04
Withdrawals from Permanent and Trust Funds to Purchase Bonds and Property			370,054.45
Total			$447,621.49

DISBURSEMENTS AND BALANCE.

From the Current Fund.

General Expenses:	Budget Appropriations.	Budget Disbursements.
Salaries	$11,700.00	$ 11,700.00
Rent	1,020.00	1,020.00
Telegraph and Telephone	200.00	153.43
Clerical Expenses	1,500.00	1,232.50
Printing, Postage and Stationery	1,300.00	1,402.90
Office Supplies	250.00	221.21
Traveling Expenses	1,550.00	1,695.97
Premium on Bonds	60.00	50.00
Auditing	75.00	75.00
Certificates	50.00	11.00
Miscellaneous	150.00	205.14
Scientific Section	25.00	41.55
Section on Education and Legislation	25.00	16.65
Section on Practical Pharmacy and Dispensing	25.00	7.97
Section on Commercial Interests	25.00	13.61
Section on Historical Pharmacy	25.00	25.59
Commission on Proprietary Medicines	50.00	
Committee on Local Branches	25.00	

Committee on Membership	1,000.00	897.49
Committee on Legislation	100.00	
Committee on Syllabus	50.00	50.00
Committee on Unofficial Standards	100.00	
Committee on Colored Glass Containers	50.00	
Drug Trade Bureau of Public Information	400.00	400.00
International Pharmaceutical Federation	120.00	120.00
Metric Association	10.00	10.00
American Conference on Hospital Service	25.00	50.00
Headquarters Building Campaign	2,000.00	1,495.98
Year Book	4,500.00	9,616.63
Library	100.00	2.12
Committee on Pharmacy Week	250.00	250.00
Pharmacy Week Window Strips	250.00	302.50
Total Appropriation for General Expenses	$27,010.00	
Total Disbursements for General Expenses		$ 31,067.24
Open Accounts:		
JOURNAL	$11,000.00	$ 15,297.00
National Formulary	1,000.00	3,702.38
Recipe Book	1,000.00	61.96
Badges and Bars	50.00	
Total Budget Appropriations	$40,060.00	
Total Budget Disbursements		$ 50,128.58
From the Permanent Funds:		
Endowment, Purchase of Bond	$ 1,041.73	
Ebert Legacy, Purchase of Bond	1,021.66	
Ebert Prize, Medal for 1931	50.20	
Life Membership, Purchase of Bond	2,039.00	
Research, Purchase of Bonds	7,414.95	
Research, Awards for 1930–1931	650.00	
Research, National Conference on Pharmaceutical Research	25.00	
Research, Expenses for Reprints, etc	66.76	
Headquarters Building, Insurance of Title	202.72	
Headquarters Building, Purchase of Bonds	275,000.00	
Headquarters Building, Transfer of Interest	9,534.51	
Headquarters Building, Settlement of Claim	50.00	
Headquarters Building, Checks Returned	24.50	
Headquarters Building, Topographical Survey	499.25	
Headquarters Building, Interest on Mortgage	1,001.00	
Headquarters Building, Taxes	923.64	
Headquarters Building, Payments on Property in Square 62, Washington, D. C	94,200.00	
Total Disbursements from Permanent Funds by Voucher Checks and Charges		$393,744.92
From the Trust Funds:		
Procter Monument, Purchase of Bond	$ 1,021.67	
Remington Honor Medal, Medal for 1931	35.00	
Total Disbursements from Trust Funds by Voucher Checks		$ 1,056.67
Total Disbursements		$444,930.17

Balance in Current Fund:		
Cash in Merchants and Newark Trust Co	$ 2,322.01	
Cash in Boston Penny Savings Bank	369.31	
Total Balance in Current Fund December 31, 1931		$ 2,691.32
Total Disbursements and Balance		$447,621.49

COMPARISON OF FUNDS.

Current Fund:	Dec. 31, 1930.	Dec. 31, 1931.
Cash in Merchants & Newark Trust Co	$ 4,125.38	$ 2,322.01
Cash in Boston Penny Savings Bank	353.06	369.31
Total Current Fund	$ 4,478.44	$ 2,691.32
Permanent Funds:		
Endowment Fund	$ 13,536.03	$ 14,052.61
Centennial Fund	5,165.41	5,359.19
Ebert Legacy Fund	7,359.04	7,629.82
Ebert Prize Fund	1,067.99	1,060.29
Life Membership Fund	39,354.60	41,009.81
Endowed Membership Fund		125.00
Research Fund	60,633.70	62,066.90
Headquarters Building Fund	494,230.33	501,303.19
Total Permanent Funds	$621,347.10	$632,606.81
Trust Funds:		
Wm. Procter, Jr., Monument Fund	$ 15,440.40	$ 16,013.96
Jos. P. Remington Honor Medal Fund	1,329.31	1,343.56
Total Trust Funds	$ 16,769.71	$ 17,357.52
Summary of Funds:		
Current Fund	$ 4,478.44	$ 2,691.32
Permanent Funds	621,347.10	632,606.81
Trust Funds	16,769.71	17,357.52
Total Funds	$642,595.25	$652,655.65

SUMMARY OF ASSETS AND TRUST FUNDS.

	Dec. 31, 1928.	Dec. 31, 1929.	Dec. 31, 1930.	Dec. 31, 1931.
Current Fund	$ 770.44	$ 1,656.82	$ 4,478.44	$ 2,691.32
Permanent Funds	473,907.94	575,751.55	621,347.10	632,606.81
Total Assets	$474,678.38	$577,408.37	$625,825.54	$635,298.13
Trust Funds	15,631.60	16,162.85	16,769.71	17,357.52
	$490,309.98	$593,571.22	$642,595.25	$652,655.65

74. Expenses of N. F. Subcommittee. Chairman Gathercoal recommends (see Council Letter No. 5, page 1345, item No. 53) that the N. F. Subcommittee on Chemistry, Chairman Glenn L. Jenkins, be authorized to expend $300.00, or so much of this sum as is required, during 1932 for its expenses, and states that "While Dr. Jenkins has made splendid progress with the chemical monographs he still has a great deal of work in connection with assays and tests in the pharma-

ceutical monographs, besides, all of the work coming up in connection with new items of a chemical nature." The recommendation is approved by the Chairman of the Committee on Appropriations.

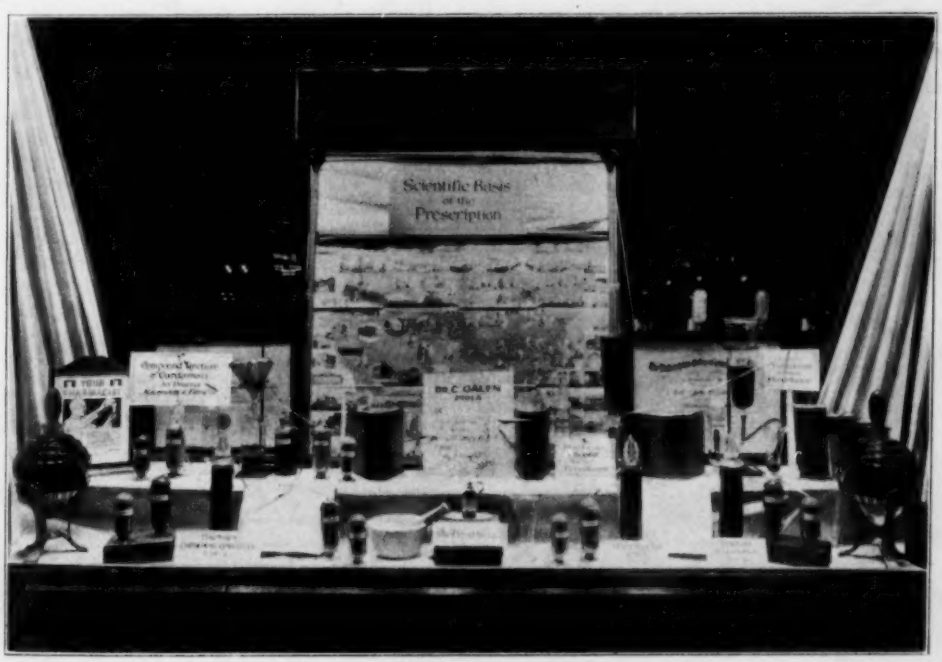
(*Motion No. 25*) *It is moved by Bradley that $300.00, or so much as is required, be authorized for the expenses of the Subcommittee on Chemistry during 1932, and charged to the National Formulary account.*

75. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 192, John Cecil Bird, 7211 Cresheim Rd., Germantown, Philadelphia, Pa.; No. 193, Calvin Gilbert Bliss, 1215 Mt. Carmel Ave., North Hills, Pa.; No. 194, Charles C. Dailey, 6535 N. 17th St., Philadelphia, Pa.; No. 195, Vinnie Lentz Hampton, 4027 Irving Park Blvd., Chicago, Ill.; No. 196, Harold Hecht, 90 Nightingale St., Dorchester, Mass.; No. 197, Frank Fidelis Law, 224 Crestmont Terrace, Collingswood, N. J.; No. 198, Robert M. Lingle, University Station, Box 196, Tucson, Ariz.; No. 199, John H. Long, 208 Washington Ave., Manoa, Pa.; No. 200, Thomas H. McNeil, 850 N. 40th St., Philadelphia, Pa.; No. 201, J. Oren Mikle, 3032 Alabama Rd., Camden, N. J.; No. 202, August John Pacini, 8100 McCormick Blvd., Chicago, Ill.; No. 203, Sister Lucilla Dunn, 820 S. Jefferson Ave., Saginaw, Mich.; No. 204, Sister Vincent, 909 W. Main St., Rochester, N. Y.; No. 205, Sister Hilda Groeninger, 909 W. Main St., Rochester, N. Y.; No. 206, Sister Helena L. Link, 2820 Main St., Bridgeport, Conn.; No. 207, Sister Margaret Mooney, The Troy Hospital, Troy, N. Y.; No. 208, Harold A. Parkison, 918 Colorado Ave., Glenwood Spring, Colo.; No. 209, Emerson D. Stanley, 1st Central Dispensary, 602 First Central Bldg., Madison, Wis.; No. 210, A. F. Silva, Reid's Drug Store, Hayward, Calif.; No. 211, Carl Snyder, 1608 1st Ave., No., Great Falls, Mont.; No. 212, Alexander Walmsley, 5046 Chancellor St., Philadelphia, Pa.; No. 213, Leon Eugene Winiarski, 3484 N. Downer Ave., Milwaukee, Wis.

(*Motion No. 26*) *Vote on applications for membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*



Prize-winning pharmacy week window.

NATIONAL PHARMACY WEEK CONTEST.

Chairman Anton Hogstad, Jr., has announced the decision of the Committee of Award in the National Pharmacy Week Contest—a Pharmacy Week Cup contributed by the Federal Wholesale Druggists' Association.

The Committee was composed of: Bernard A. Bialk, *Chairman;* J. H. Webster, L. A. Seltzer, Fred Ingram, Jr., George H. Dikeman.

The award was made by a process of elimination, careful study being made of a large number of displays, which gradually brought down the number until, finally, the selection was made, and even then the decision was reached by a majority vote. The Committee states:

"It was highly gratifying to the Committee to find so many pharmacists throughout the country interested in professional pharmacy. Several hundred photographs were submitted each one of them being a credit to the pharmaceutical profession. It is the hope of the Committee that the Pharmacy Week Window idea will spread throughout the entire country and the interest in regard to professional pharmacy windows be multiplied many times in the years to come.

"The success of the 1931 Pharmacy Week is a splendid tribute to the late Robert J. Ruth, the father of this splendid idea. May the pharmacists, through the pharmaceutical associations throughout the country, carry on.

"The Committee is very grateful for the opportunity of being able to serve and do its bit toward making 1931 Pharmacy Week a success."

Haussmann Pharmacy, 6th and Girard Sts., Philadelphia, was declared the winner.—The window told a complete story—the theme "Scientific Basis of the Prescription" was carefully worked out in such minute detail that the layman could readily see the prescription in the various steps, from the crude drug to the finished product. Haussmann Pharmacy also made use of the Pharmacy Week Window Display material, which was taken into consideration.

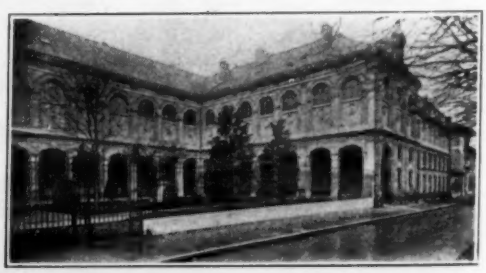
Honorable mention was accorded to the display of W. M. Federmann, Kansas City, Mo. Much time was given to the preparation of the display—crude drugs and apparatus, each article plainly marked, made up the greater part of the window.

Edward J. Ireland, Madison, Wis., came in for third place—crude drugs and pharmaceutical books made up the background—the United States Pharmacopœia of 1820 and that of 1920 stood out very prominently in this display.

The fourth choice—that of O'Brien Drug Company, Omaha, Neb., featured pharmaceuticals and apparatus.

J. C. Scow Pharmacy, of Berkeley, Calif., entered four pictures, representing one window of 45 running feet of display, showing a keen interest in pharmacy.

T. Potjewijd, Secretary-General of International Pharmaceutical Federation. Dr. Potjewijd is also pharmacist of the University Hospital, Leyden, Holland.—See his articles in January number, pages 50–55.



École Supérieure de Pharmacie (Paris School of Pharmacy) main entrance.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

CHICAGO.

The 203rd meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the University of Illinois School of Pharmacy on the evening of Tuesday, January 19, 1932.

The meeting was opened by President Hynes who called for the report of the nominating committee for officers of the Chicago Branch for the coming year.

Dean Day presented the following nominations: *President,* R. E. Terry; *First Vice-President,* G. L. Webster; *Second Vice-President,* R. A. G. Linke; *Third Vice-President,* S. W. Morrison; *Secretary-Treasurer,* L. Templeton. *Committee Chairmen:* **Membership,** C. P. Van Schaack; **Legislation,** J. Reimenschneider; **Practice,** J. A. Becker; **Medical Relations,** Dr. Bernard Fantus; **Publicity,** Samuel C. Henry.

A unanimous vote was given for the nominations presented.

Mr. Emig, instructor in the Pharmacy School, gave a review of the contents of the December issue of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The speaker of the evening was Colonel James Franklin Bell, Director of the Industrial Exhibit of the Century of Progress Exposition.

Colonel Bell gave a very interesting discussion of the progress that had been made by the United States since the last Chicago Fair.

The coming World's Fair is receiving the support of the nations of the world and already a majority of the states have made appropriations for their representation at the Exposition.

The financial backing of this enormous undertaking has been supplied by eighty of the most prominent and influential business men of Chicago.

The professions of Pharmacy, Medicine and Dentistry are going to be located in the same building. The directors of these branches have been chosen with the view in mind of giving these professions the best of representation.

Professor Terry, the newly elected president, called for a rising vote of thanks for Colonel Bell and the meeting was adjourned.

LAWRENCE TEMPLETON, *Secretary.*

CINCINNATI.

The January meeting of the Cincinnati Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday, January 19th, at 2:30 P.M., at the Cincinnati College of Pharmacy.

The minutes of the previous meeting were read and approved.

Chairmen of the various standing committees had no reports to make, but the Publicity Committee suggested that materials for publication be sent in several days before the date of the meeting, as the newspapers do not consider material a day old as news. This suggestion will be followed.

President Herman Schuler was speaker of the afternoon. His subject was "Pharmacy and Business in South America." He had spent a number of years in South America, not only in the principal cities but also in the outlying districts and so was well qualified to give a comprehensive view of his subject. Pharmacy as

practiced in South America, in some respects, is quite similar to pharmacy here, that is, in the principal cities. The large cities have pharmacies which for size and beauty surpass many of our large stores here. Not only are they well stocked with pharmaceuticals but also with almost every known proprietary and toilet articles. Their toilet goods departments are especially well stocked with many kinds of perfumes for which the natives have great fondness. The principal cities are generally built around a great center circle. Here the large pharmacies are located and you generally find a pharmacy for each nationality, as French, German, English, Spanish, etc. Each of these handle the medicines peculiar to their country. The American or English apothecary, then, would have all the proprietary medicines which we are so accustomed to handle. Likewise the German apothecary would have the many teas, herbs and proprietary medicines which the German element there would be likely to seek.

The wages of the registered pharmacists are about the same as they are here, however, the hours of work are much shorter. One of their characteristics is to close the store at midday for two hours. This custom, as Mr. Schuler jokingly remarked, will never be adopted here.

We are accustomed to seeing as complete and as beautiful stores in our suburbs as in the cities. Suburban stores in South America take on quite another aspect. There the stores in the suburbs or outlying districts are nothing more than simple huts, having a large opening in front and rear, no floor covering and very little stock. Little or no prescription work is done and no proprietaries, candy or cigars, etc., are sold. They handle perfumes, and some of the native herbs and roots, and that's about all.

The laws relating to pharmacy are very strict. No one but a "Registered Pharmacist" may own a drug store, so we see every pharmacy is safely in the hands of a pharmacist. The Colleges of Pharmacy there are also very strict. Should a student fail in his studies, he is not permitted to take them over in the following semester, but must withdraw altogether.

Another interesting observation presented by Mr. Schuler related to merchandising methods of some of the wholesale houses. They not only supply the retailers with nationally known products, but also with many products put up under their name; and then, with all of this, run retail stores in their own right next to or across from the other stores. Yet there could be no better competitors, for the wholesaler never prices his articles below that of his competitor.

Doctors in South America write few prescriptions but supply patients with medicines. This, however, does not mean that they do much dispensing, but rather due to the fact that 85% of the natives suffer with genital diseases, and the doctors treat them right in their offices. Mr. Schuler gave an example of one physician who had a large office, and this office contained a large long table upon which were placed a row of some thirty syringes, each numbered for some patient. So when the patient needs attention, the doctor selects his syringe and gives the treatment.

Mr. Schuler concluded his address by saying that in his estimation there was a great field in South America for the manufacturers of serums, anti-toxins and biologicals.

R. L. PULS, *Secretary.*

DETROIT.

The January meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Y. M. C. A. Building, Thursday, January 21, 1932; the meeting was preceded by a well-attended dinner. President James Liddell called the meeting to order at 7:45 P.M. The minutes of the previous meeting were read by the secretary and approved. President Liddell requested Dean R. T. Lakey of the College of Pharmacy of the College of the City of Detroit to introduce the speaker of the evening, Dean W. L. Coffy, of the College of Liberal Arts of the College of the City of Detroit. His subject was entitled "Urban University." He said that this country has been engaged in higher education for a comparatively short time; however, the city college or university, the first in higher learning, had its origin in Greece. From here the idea spread to the Romans and other European nations. The study of languages was encouraged from the very beginning.

After the Civil War the college idea spread to the United States, where religion was emphasized in addition to languages. The Massachusetts law of 1642 required that elementary education be given by the servants, and was the first law enacted in this country in promotion of education.

In 1647 rapid strides were made; secondary education was taught at the price of five pounds per pupil—this marked the beginning of the public school system, which was followed by the academy movement. Franklin's

Academy, established in 1751, was the forerunner of the public high school.

Dr. Coffy said the high school from 1840 to 1890 was a feeble institution. The last thirty years has seen this department of public education rapidly climb to the position it now holds in the education of the American youth.

The speaker said the college idea began in the year 1819, and was the outcome of the Dartmouth Case argued by Daniel Webster before the Supreme Court. A number of colleges were founded from 1830 to 1870. According to Dr. Coffy, Michigan is one of the outstanding states in public education; the University of Michigan was founded in 1836 and the same year that it became a separate institution, state schools were inaugurated and a superintendent was appointed. In 1862, 30,000 acres of land were given to the state by Congress, to develop the public school system and, in 1865, experiment stations were established.

Some startling figures were brought out in Dr. Coffy's talk. He said there are 145,000 school boards in the United States who are representative of the many communities. The cost of education to the City of Detroit is $3,558,341,290, of this the University of Michigan receives $2,015,058; Teachers Colleges, $997,454; Michigan State College, $752,439 and the College of the City of Detroit, $450,000. He said the establishment of the City College was due to the breaking down of the apprentice system and the rapid shifting of the population; in 1890, 35 per cent of our people were urban; in 1900, 38 per cent; in 1910, 45 per cent; in 1920, 51 per cent and, in 1930, 77 per cent. The speaker added that the success of the City College was due to the opportunity offered the many who could not afford to attend the State Universities, but desired higher education to gain—*first*, competent leadership; *second*, adequate training; *third*, proper social and economic relations; cosmopolitan viewpoint; *fourth*, healthful living; *fifth*, building up a standard for valuations.

Dr. Coffy closed his talk by defending the present system of public school regulation by the State, as federal control would tend to put the school system into politics, and no real good could come from such action.

A general discussion followed, lead by Fred Ingram, Jr., L. A. Seltzer and R. T. Lakey, after which Mr. Ingram moved a rising vote of thanks to Dean Coffy for what he claimed to be one of the most inspiring and educational talks ever presented before the Detroit Branch. A rising vote of thanks was cheerfully given.

Chairman Lakey, of the program committee, announced Howard T. Graber as the speaker for the February meeting and L. A. Danse as the speaker for the March meeting. The April meeting is to be given over to the pharmacy students; the Annual Student Night Program and the May meeting are to be held in Ann Arbor at which time Dean Edward H. Kraus of the University of Michigan College of Pharmacy will supply the speaker; this will close the season.

NEW YORK.

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the College of Pharmacy, Columbia University, on Monday, the 11th, the chair being taken by the president, Dr. Robert P. Fischelis. There was an attendance of about 65.

The minutes of the December meeting were read by the secretary and approved.

Treasurer Currens' report was read and accepted.

Dr. Mayer, for the Audit Committee, reported that he had approved of the bills submitted to him.

The secretary reported that Messrs. E. F. Pinner, M. Baumann and A. J. Monte-Bovi had become members of the Branch through joining the parent organization.

Dr. Fischelis announced that the February meeting would be in charge of President Albert A. Muench of the New York State Pharmaceutical Association and reports on the work of the various Committees of the State Association would be read and discussed. He also called attention to the Editorial on A. PH. A. Membership that appeared in the December issue of the *American Druggist*.

Dr. Schaefer, Chairman of the Entertainment Committee for the meeting of the Boards and Colleges of Pharmacy of District No. 2, said that the banquet in honor of the delegates, which would take the place of the March meeting of the Branch, would be held on Monday, March 14th, at the Hotel Pennsylvania; he stated that the program for the entertainment at the banquet was being arranged and the artists' expenses defrayed by the courtesy of the *American Druggist*. He urged all members of the Branch to make a point of attending the banquet.

Chairman Lehman of the Committee on Education and Legislation, reported briefly on

the various bills that were going to be submitted by the New York State Pharmaceutical Association to the State Legislature, and said that these would be fully discussed at the February meeting of the Branch. He said that the Department of Health of the City had recently been active in examining shop labels for the required statements regarding alcoholic, acetanilid, etc., content, and urged pharmacists to be certain that their labels met the requirements of the Department.

The president called attention to a new item that appeared in the *United States Daily* of January 11th, referring to a survey carried out by the Baltimore Station to determine the accuracy with which druggists compounded prescriptions; a hundred representative drug stores were tested and many glaring inaccuracies, revealing great carelessness, were found. He said that if the public once lost confidence in the pharmacist's ability to fill prescriptions accurately, it would be a sorry day for pharmacy.

Dr. Mayer, reporting for the Nominating Committee, submitted the following list of names:

President, Robert P. Fischelis
Vice-President, Ernest A. Bilhuber
Secretary, Herbert C. Kassner
Treasurer, Turner F. Currens
Delegate to House of Delegates and Secretary of Remington Medal Committee, Hugo H. Schaefer.

Chairmen of Committees.

Education and Legislation, Robert S. Lehman
Progress of Pharmacy, Charles W. Ballard
Professional Relations, Charles E. Heimerzheim
Audit, Joseph L. Mayer
Membership, Barnett Miller.

The report was accepted and Dr. Raubenheimer cast one ballot for electing the officers and committee chairmen. The officers expressed their thanks for the honor of being re-elected.

Chairman Brown, of the Committee on the Progress of Pharmacy, gave a very interesting report on the following subjects: "The Gillette Razor Deal with the United Cigar Stores and Its Significance to the Retail Pharmacist;" "The Drug Store of Yesterday, To-day and To-morrow," by President Walter D. Adams of the A. PH. A.; "The Production of Methyl, Ethyl and Butyl Alcohols," and "A Preliminary Report of the National Drug Store Survey," being conducted in St. Louis by the Department of Commerce.

The president now introduced the speaker of the evening, Dr. Gerard L. Muench, surgeon in the New York City Police Department and associate professor of Gynecology of the New York Post Graduate Medical School, Columbia University, who delivered an address on "The Doctor in the Service of New York City."

Dr. Moench began his talk by referring to the progress that had taken place in the development of preventive medicine, by which the growth of epidemics had been checked; small-pox, cholera, typhoid, etc., were almost wiped out, diphtheria and other diseases occurred much less frequently. In order to give a picture of the work confronting the City Departments, he quoted the following interesting statistics: 1200 to 1500 persons die each week and about 1800 to 2000 are born; dwellings in the city, which has an area of 310 square miles, number about 400,000; the assessed valuation is 18 billions. Schools number 574, with an average attendance of about a million and a staff of 30,000 teachers. There are 300 hospitals, asylums, etc., about 20 of these being city hospitals. In a year 32,000 fires occur, with 11,000 false alarms; in these over 111 million gallons of water were used, of which 31 million were salt water.

He showed how the various departments were interdependent and outlined the work of medical officers in the fire, police and sanitary departments. From his former experiences as Medical Examiner he told some interesting stories of work in the slums, and in the Chinatown opium dens, including some murder and homicide cases.

He concluded by telling of the important work of Dr. Charles Norris, the Chief Medical Examiner, and Dr. Gettler, City Toxicologist, in post-mortem examinations.

In the discussion which followed, Messrs. Lehman, Lewitus, Lichtman and Mayer took part.

A rising vote of thanks was accorded to Dr. Muench.

Vice-President Bilhuber welcomed Dr. Otto Raubenheimer to the platform to deliver a short address on "The New Belgian Pharmacopœia."

Dr. Raubenheimer began by giving a brief history of the Belgian Pharmacopœia; he went on to explain in detail how the Belgian government, through the Pharmacopœia, had safe-

guarded the handling of poisons by the following system, of which he highly approved:

1. The poisons that are listed in Table I are marked in the Pharmacopœia by a single cross and must be dispensed in an amber octagon bottle.

2. Those listed in Table II can only be dispensed on written order, the more poisonous drugs being designated in the Pharmacopœia by two crosses; the latter must be kept under lock and key.

3. Narcotics are marked with two crosses and an S and are listed in Table V.

The adult single daily dose and the maximum daily dose are given for all poisonous substances. The physician cannot prescribe a dose larger than the maximum unless he writes out the quantity of the particular drug in full and marks this with his signature; if he fails to do this, the pharmacist has a right to refuse to fill the prescription or he can simply reduce the dose to the maximum daily dose. In labeling prescriptions that contain the maximum dose the pharmacist uses a green label which cautions the patient not to take an overdose.

For poisons in general an orange and black label with skull and cross bones is used, while substances for external use only, not necessarily so poisonous, bear an orange and red label.

He referred to changes in nomenclature, and the permitted substitution of methyl salicylate for oil of wintergreen, morphine hydrochloride, for morphine acetate and any kind of edible oil in certain formulas in place of olive oil, etc. He said that the Belgian Pharmacopœia was a distinct contribution to pharmacy and that all could learn much by perusing its contents.

A discussion followed and Dr. Bilhuber and Dr. Muench took part.

Mr. Gesoalde rose to compliment Dr. Raubenheimer on his interesting address and the meeting concluded with a rising vote of thanks.

HERBERT C. KASSNER, *Secretary.*

The Druggists Circular writes of the Makers of American Pharmacy. The editorial is concluded with congratulations, a view into the past, an estimate of the present and confidence in the future of pharmacy.

DISCUSSION OF THE PHILIP SURVEY.

Representatives of a number of pharmaceutical manufacturing houses and others interested met at the Hotel Pennsylvania in New York City on February 8th to discuss the Philip Survey. The purpose is to determine the policy of manufacturers who desire to guarantee a certain definite sales status. Mr. Philip presided and explained the purpose of the meeting which was attended among others by Dr. R. B. J. Stanbury, *secretary* of the Canadian Pharmaceutical Association, who recently completed a survey similar to that of Mr. Philip.

Secretary E. L. Newcomb and Secretary E. F. Kelly attended. Samuel Dworkin was present as a retailer and association member, also a number of manufacturers' representatives.

The results of the Philip Survey were shown on large charts with replies to the question. During the discussion Carl Weeks urged that a bill be prepared which would recognize a manufacturer's trade mark and prohibit its use without the owner's authorization.

Secretary Newcomb stated that adequate legislation is needed to define "unfair practice." The results of the discussion are being considered by Mr. Philip with the end in view of shaping them into constructive and helpful efforts.

CHAIN STORE REPORTS.

The Federal Trade Commission has sent three more chain store reports to the Senate, one covering the scope of its inquiry, a second the sources of chain-store merchandise, and a third the wholesale business of chains. They are factual and do not contain recommendations. These reports will be made available in due course.

The Department of Commerce is making a survey of delivery and cost problems; lately, the work has been carried on in Boston.

FACTS CONCERNING INDUSTRIAL ALCOHOL.

Commissioner J. M. Doran has prepared a booklet under above title in which the lawful use of industrial alcohol is explained, one of the purposes being to prevent diversions of alcohol to illegal channels, and the informative compilation is responsive to a demand which has come to the Commissioners.

EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, WILLIAM B. DAY, C. E. CASPARI, J. H. BEAL, W. BRUCE PHILIP, T. J. BRADLEY. *Ex-Officio Members:* WALTER D. ADAMS, *President;* J. G. BEARD, J. W. DARGAVEL, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* THOMAS ROACH, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; E. N. GATHERCOAL, *Chairman,* N. F. Revision Committee; Chairmen of the Sections, A. PH. A.: L. E. WARREN, C. J. CLAYTON, W. G. CROCKETT, ROWLAND JONES, J. T. LLOYD, TOWNES R. LEIGH, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; A. L. I. WINNE, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P. Scientific Section—Board of Review on Papers: *Chairman,* GLENN L. JENKINS, Baltimore, Md.; EDWARD E. SWANSON, Indianapolis, Ind.; W. J. HUSA, Gainesville, Fla.

LET US ASSIST YOU IN SOLVING PRESCRIPTION PROBLEMS.

Dr. S. L. Hilton, former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, *Chairman* of its Council, and well and favorably known pharmacist of Washington, has consented to answer problems that come up in prescription practice. We desire to express appreciation for this coöperation and know that the suggestions related to prescriptions will be sources of valuable information. Mail your prescriptions with explanation of the trouble you have had with them and explain your procedure and why the resulting preparation has not been satisfactory. Address the JOURNAL A. PH. A., 10 West Chase Street, Baltimore, Md. The valuable work of Dr. Hilton on the U. S. P. and N. F. is known to you.

ENGLISH TRANSLATION OF THE JAPANESE PHARMACOPŒIA.

The Japan Pharmaceutical Society discussed the plan of translating the Japanese Pharmacopœia No. 5 revised at its meeting on December 12th. It has been decided that no comparative list of chemicals will be included in the pharmacopœia, because comparison is said to be impossible as two sets of same medicine may be made of different raw materials. The inclusion of this list was to be made in accordance with Article 8 of the Brussels International Conference in 1925.

IOWA PHARMACEUTICAL ASSOCIATION.

Among the speakers at the Iowa Pharmaceutical Association, were President Walter D. Adams, of the AMERICAN PHARMACEUTICAL ASSOCIATION; President John W. Dargavel, of the National Association of Retail Druggists; Paul C. Olsen, and President-elect W. B. Philip, of the AMERICAN PHARMACEUTICAL ASSOCIATION.

A booth at the Great Northwestern Drug Show, to be held in Cedar Rapids, will be set aside for the general use of the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION. This is a plan suggested by Lee S. Coy of Cedar Rapids and it is hoped to make this display so effective that it will be utilized at other State association meetings. The Iowa convention holds forth during four days, namely, from the 16th to the 19th of February. On the first day the officers of the Association make their reports and all of them have something worth while. Addresses were arranged for on different days; and throughout the meeting was both interesting and instructive.

ANTISEPTICS, DISINFECTANTS—TESTS DESCRIBED BY BULLETIN, U. S. DEPARTMENT OF AGRICULTURE.

After twenty years' experience with the problem of determining the accuracy of claims of bactericidals and antispetics made for disinfectants and antiseptics, the Federal officials

have become convinced that certain tests are well suited for judging such products. These tests, selected by the insecticide control office of the Food and Drug Administration, are described in circular No. 198-C, "United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants," just published by the Department of Agriculture.

The authors of this bulletin, G. L. A. Ruehle, senior bacteriologist, and C. M. Brewer, associate bacteriologist of the administration, write:

This possibility of misunderstanding would be obviated if the same methods were employed by all, and many manufacturers, recognizing this, have requested information as to the methods employed by the Food and Drug Administration.

The circular describes several tests, including the Food and Drug Administration (F. D. A.) phenol-coefficient method, and the wet and dry filter-paper, the agar-plate, the serum agar-plate, and the agar cup-plate methods. It is illustrated and includes citations of the literature. A copy of circular 198-C will be sent free at request by the United States Department of Agriculture, Washington.

BRIEF NEWS ITEMS FROM MEXICO.

BY DR. G. G. COLIN.

PHARMACISTS SEEK SUPPORT FROM MANUFACTURERS.

A small group of pharmacists in the city of Mexico organized an association seeking a compensation for their work in merchandizing patent medicines. This group addressed manufacturers in a circular, stating that pharmacists have been coöperating with manufacturers for many years in the sale of their products. In many instances the profit is so small that the pharmacist is at a loss buying certain preparations. They claim that manufacturers should offer a small subsidy, amounting to some $50.00 a year, in order to stimulate the sale of their products through the drug trade. Certain manufacturers commented on this request as being absurd since they furnish the necessary means to stimulate the sales of their products, thus helping the pharmacist.

PHYSICIANS ORGANIZE TO MANUFACTURE PHARMACEUTICAL PRODUCTS.

A group of prominent physicians has organized to form the "Unión Médica Mexicana," a coöperative society, to manufacture medicinal preparations, thus becoming independent from foreign products. These products are manufactured at the "Terapia Laboratóries," managed and controlled by the Unión Médica Mexicana in the city of Mexico. The number of stock holders in this society is rapidly increasing. The demand for "Terapia" products is good and rapidly increasing in sales volume.

SURGICAL COTTON.

In spite of the fact that the supply of cotton is abundant, no effort had been made to manufacture a product for surgical use until recently.

One factory has been operating for some time successfully and the product is being consumed in preference to imported material.

A prominent physician has organized another company with a capital of about $300,000.00. It is claimed that the product manufactured is superior to any imported cotton for surgical use. The production of this new factory is all sold to the government, for use in its various hospitals and other health institutions.

NATIONALISTIC CAMPAIGN.

In view of the severe depression in business now being felt in this country, Congress has organized a well-conducted campaign to stimulate the consumption of home-made products in preference to imported similars.

The results for this campaign have been very satisfactory. Manufacturers of patent medicines and pharmacists state that both the public and physicians are giving preference to products made in Mexico.

PERSONAL AND NEWS ITEMS.

Dean Jacob Diner, of the Fordham College of Pharmacy and former president of the New York Pharmaceutical Conference, was guest of honor at a testimonial dinner given under the auspices of the Fordham Alumni Association at the Hotel Biltmore, February 3rd. The dinner marked the twentieth anniversary of the Fordham College of Pharmacy. J. J. Hammer was *chairman* of the Committee on Arrangements.

Delegations from every New York pharmaceutical association attended the affair.

Dr. Hugh S. Cumming, Surgeon General of the United States Public Health Service, Department of the Treasury, on January 26th was reappointed to his office by President

Hoover. His nomination was confirmed by the Senate.

The following have become "life members" of the AMERICAN PHARMACEUTICAL ASSOCIATION: **Wilhelm Bodemann,** Chicago; **Theodore J. Bradley,** Boston; **Edward A. Hay,** Portland, Me.; **H. K. Mulford,** Philadelphia; **Miers Busch,** Philadelphia; **George D. Rosengarten,** Philadelphia; **Freeman P. Stroup,** Philadelphia, Pa.

William Mair, F. C. S., *Honorary Member* of the AMERICAN PHARMACEUTICAL ASSOCIATION, has been elected a Fellow of the Royal Geographical Society. This distinguished body has lately completed the hundredth year of its existence in London.

First Vice-President **Louis Charles Brenner,** of Texas Pharmaceutical Association, was honored by San Antonio Retail Druggists' Association at its annual dinner. Chairman George Keene presided. Among the speakers were President Walter D. Adams, A. PH. A.; officers and members of Texas Pharmaceutical Association, Board of Pharmacy, Dean W. F. Gidley and others.

Charles G. Merrell wears a forty-five year William S. Merrell service pin and **Lee Wiltsee** carries one with 37 years' record, representing nearly a third of the years of the establishment's history. It is worthy of mention that sixty-four employees have served the Merrell Company five years or more; thirty employees ten years or more; thirteen employees fifteen years or more; five employees twenty years or more; four employees twenty-five years or more; and seven employees thirty years or more.

New Yorker Deutscher Apotheker-Verein, on February 4th, held a Dr. Hermann Thoms memorial meeting. President Dr. O. P. M. Canis presided and Emil Roller, Otto Raubenheimer, Curt P. Wimmer and A. R. L. Dohme took part in the program.

The medal of the American Institute of Chemists has been awarded to Dr. Charles H. Herty. This medal is awarded annually for "noteworthy and outstanding service to the science and profession of chemistry in America," and is given to Dr. Herty in recognition of his efforts over a long period of years on behalf of American chemists and the American chemical industry. Recently, Dr. Herty had aided the economic rehabilitation of the South by his researches on the paper pulp possibilities of the slash pine. This work is being perfected commercially in the new laboratory built for the State of Georgia by the Chemical Foundation.

Professor J. Willard Hershey, of McPherson College, Kansas, reported that oxygen and nitrogen, chief constituents of the air, are not alone sufficient to keep life aglow. His experiments showed that animals die after living ten days to three weeks in air from which carbon dioxide and rare gases, helium, argon, krypton, etc., are removed. Professor Hershey predicted that helium atmosphere would be used in fighting diseases just as oxygen atmospheres are now utilized in treating pneumonia. Large factories and office buildings supplied with synthetic atmospheres in which oxygen is mixed with helium instead of nitrogen are also foreseen by Professor Hershey as a result of his tests.

Dr. Nicholas Butler, this year, celebrates the 70th anniversary of his birth, the 50th of his graduation and the 30th of his presidency of Columbia University.

JAPANESE PHONE PRESCRIPTION.

The case in question was as follows: Sadao Kobayashi, proprietor of a dispensary in Minami Shenju, Tokyo, received from a resident a request to prepare a medicine, the prescription of which was given by a physician by the telephone, and the pharmacist prepared the medicine in accordance with it. The lower courts declared the pharmacist guilty of violation of the law and imposed a nominal fine, but the Pharmaceutical Society decided to make a test case and carried the case to the Supreme Court, resulting in a favorable verdict.

Sonntagsblatt Staats-Zeitung und Herold, of February 7th contains an account of the Dr. Hermann Thoms memorial meeting under the auspices of the N. Y. Deutscher Apotheker-Verein; also a tribute of the Society. A copy of the latter was inscribed for the widow, and Emil Roller presented a portrait of the deceased to the New York College of Pharmacy. We are indebted to Editor Hugo Kantrowitz for a copy of the publication named.

PHILADELPHIA VETERANS.

The Philadelphia Veteran Druggists met on January 15th for dinner, current business and election of officers for 1932. The following were elected: *President,* Harry Swain; *Vice-President,* David J. Reese; *Treasurer,* George W. Fehr; *Recording Secretary,* Alex G. Keller; *Corresponding Secretary,* Charles T. Pickett.

SOCIETIES AND COLLEGES.

FIRST CALL OF THE SCIENTIFIC SECTION A. PH. A.

Members and Friends of the Scientific Section, American Pharmaceutical Association:

The 80th annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Toronto, Canada, August 22 to 27, 1932, at the Royal York Hotel. This will be a joint meeting with the Canadian Pharmaceutical Association and will be unusually interesting and no doubt very well attended.

The officers of the Scientific Section are very desirous of maintaining and even of increasing the interest which has been manifest at recent meetings. Will you please, therefore, give serious consideration to any papers you may desire to present before the Scientific Section and send in the titles with a brief but descriptive abstract to the secretary as soon as convenient? These should be in by June 15th so that a multigraphed list of abstracts can be made available at the meeting.

L. W. ROWE, *Secretary*,
c/o Parke, Davis & Co.,
Detroit, Michigan.

L. E. WARREN,
Chairman, Scientific Section.

RESEARCH FELLOWSHIP.

The National Conference on Pharmaceutical Research announces a fellowship.

1. *The name of this fellowship* is "The Fellowship of the National Conference on Pharmaceutical Research." The amount of this fellowship is $1000.00.

2. *Qualifications of the Recipient:* The recipient must hold a bachelor's degree from a school of pharmacy holding membership in the American Association of Colleges of Pharmacy.

3. *Basis of Award:* The fellowship will be awarded for high scholastic attainment during the two preceding years, and for research ability as evidenced by research completed or conducted and published, or intended for publication.

4. *How the Fellowship Shall Be Awarded:* The fellowship shall be awarded at the discretion of a committee of the National Conference on Pharmaceutical Research. This committee is composed of the chairman, secretary, treasurer and two other members elected by the Executive Committee. Notice of the meeting of this committee for consideration of the award shall be given to the deans of the schools of pharmacy in the American Association of Colleges of Pharmacy, advising them to notify the graduate students, and also the pharmaceutical press at least three months prior to the annual meeting of the National Conference on Pharmaceutical Research. The award shall be made at the annual meeting of this Conference.

5. *Purpose of the Award:* The purpose of this fellowship is to establish under the direction of the pharmaceutical faculty a ten months' scholarship in a graduate school, awarding a doctor's degree that is recognized by the American Association of Colleges of Pharmacy and the graduate faculty of the university, or academic evaluating agencies.

6. *Disposition of Research:* The research conducted under this fellowship shall be presented after completion to a recognized pharmaceutical journal for publication.

For further details regarding the awarding of this fellowship, applicants are advised to address the Secretary of the National Conference of Pharmaceutical Research—John C. Krantz, Jr., *Secretary*, National Conference on Pharmaceutical Research, 2411 N. Charles Street, Baltimore, Md.

BALTIMORE VETERANS.

David R. Millard was elected president of the Baltimore Veteran Druggists' Association at the meeting of January 21st. Mr. Millard is a member of the firm of Morgan and Millard, Baltimore, and a former president of the Maryland Pharmaceutical Association. He has long been active in the Baltimore Retail Druggists' Association, and other state pharmaceutical organizations, and served for a number of years as secretary of the Maryland Board of Pharmacy. He is one of the charter members of the Veterans' Association, and has been most regular in his attendance and in the interest which he has shown. Dr. A. G. DuMez was reëlected secretary, and Charles C. Neal was reëlected treasurer.

AMERICAN PUBLIC HEALTH ASSOCIATION.

This year (1932) will witness the two hundredth anniversary of George Washington's birth, and many societies, among them the American Public Health Association, will hold

their meetings in our Nation's Capital. The A. P. H. A. meetings bring together experts from all over this and other countries and are of great interest to health officers, nurses, food and nutrition experts, sanitary engineers, school physicians, directors of hospitals and specialists in all branches of public health work. This year's meeting will be from October 24th to 27th, inclusive. Additional information can be obtained by writing to the A. P. H. A., 450 Seventh Ave., New York City.

MINNESOTA PHARMACEUTICAL ASSOCIATION.

The Minnesota State Pharmaceutical Association held its annual convention at Minneapolis, February 10th to 12th. The program was a most interesting one; many addresses of importance and papers of interest were presented. One day, as usual, was given over to a joint meeting of the Scientific and Practical Sections of the Minnesota State Pharmaceutical Association and the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, of which section Dr. Frederick J. Wulling is the *chairman;* he presided with the assistance of Rugnar Almin, president of the Branch.

A Veteran Druggists' Luncheon was also held during the convention.

The annual banquet was held at the Nicollet Hotel. The speakers of the occasion were the Mayor, Wm. A. Anderson; Wm. Dornfield, of Chicago; and Samuel C. Henry and Prof. E. F. Witte. We hope to have further reports of these two conventions in the next issue of the JOURNAL.

BOSTON DRUGGISTS' ASSOCIATION.

Boston Druggists' Association held the annual meeting and dinner January 26th, at the Parker House. In accord with the established practice of rotating the presidency to a retail druggist, a manufacturing druggist and a man in the wholesale drug trade, Charles A. Loring, of Gilman Brothers, wholesalers, was elected to head the association for a year. Others elected were: *Vice-President,* C. Herbert Packard; *Secretary-Treasurer,* Walter R. Dolliver, of the Eastern Drug Company; *Members of the Executive Committee,* the retiring president, Samuel M. Best; M. E. Adamo, H. C. Wiggin, C. F. Wright, W. H. Glover, William R. Acheson, Prof. Theodore J. Bradley; *Nominating Committee,* A. L. Mackusick, W. T. Withington, H. D. Thayer, J. P. Murphy and J. E. Mullen.

Mr. Best, the retiring president, was toastmaster at the dinner; the speaker of the evening was Mrs. Emma Fall Schofield, judge of the district court at Malden, Mass.

WASHINGTON PHARMACISTS.

Washington Wholesale Drug Exchange has issued a booklet giving an historical account of this successful establishment—issued under the direction of Secretary A. V. Burdine and President Paul Pearson.

The Washington Veteran Druggists held its annual meeting with an elaborate dinner at the Raleigh. Ladies were invited to the annual occasion, also veterans and ladies of Baltimore. President Afflick made the introductory remarks and introduced Paul Pearson as toastmaster. A number of delightful entertainments added to the enjoyment of the evening.

THE UNIVERSITY OF ILLINOIS SCHOOL OF PHARMACY LOAN FUND.

Dean William B. Day writes that in 1917 the Women's Organization of the Chicago Retail Druggists' Association provided a sum of money to be used in establishing a loan fund and subsequently added to this fund.

At the beginning of the present school year the fund amounted to $667.12 with accumulated interest. After the death of Albert E. Ebert the Alumni Association undertook to raise a fund for a scholarship as a memorial to the deceased. The largest contribution to the fund was made by Mr. Henry S. Wellcome who gave $500.00. The efforts of the Alumni did not succeed in raising a fund sufficient for a scholarship, and after carrying the fund in the Alumni treasury for some time turned the amount over to the University of Illinois to be added to the loan fund, with an understanding that the name of the loan fund be changed to the Ebert Loan Fund. This now amounts to about $2000.00.

Loans are made to deserving students upon the recommendation of the Dean and are repaid within four years by a freshman student; three years by a junior student; or two years by a senior student, dating from the ensuing 30th of June. No interest is charged the recipient while he is in school.

Joseph W. E. Harrisson has been appointed lecturer on Physiological Assay at the Philadelphia College of Pharmacy and Science.

FOURTH DISTRICT MEETING OF BOARDS AND COLLEGES.

All members of Fourth District of the National Association Boards of Pharmacy and American Association Colleges of Pharmacy are called to meet at the Roosevelt Hotel, Cedar Rapids, Iowa, at 2:00 P.M., Feb. 17th and 18th.

This meeting is held in conjunction with the annual convention of the Iowa Pharmaceutical Association and the Great Northwest Drug Show, in Cedar Rapids during the week of February 15th.

J. W. SLOCUM, *V.-P.*
Fourth District N. A. B. P.

TENTATIVE PROGRAM—JOINT CONFERENCE, BOARDS AND COLLEGES OF DISTRICT NUMBER TWO, HOTEL PENNSYLVANIA, NEW YORK CITY, MARCH 14TH AND 15TH.

MONDAY MORNING SESSION—10:00 A.M.

Call to order.

Roll call of Boards and Colleges.

Introductory remarks by Vice-President Hugh C. Muldoon for the Colleges and Vice-President Robert P. Fischelis for the Boards.

Remarks by President A. L. I. Winne of the National Association of Boards of Pharmacy, or H. C. Christensen, Secretary of the National Association of Boards of Pharmacy.

Appointment of Committees.

Preliminary reports of Standing Committees.

Committee on Chemistry, L. L. Walton and G. L. Jenkins, Chairmen.

Committee on Pharmacy, R. L. Swain and Jacob Diner, Chairmen.

Committee on Materia Medica, H. C. Wood and J. M. Woodside, Chairmen.

MONDAY AFTERNOON SESSION—2:00 P.M. AND 4:00 P.M.

Complete report of the Committee on Materia Medica—Messrs. H. C. Wood, J. R. Minehart, C. E. Ballard, J. M. Woodside, G. A. Bunting and William Mansfield.

At this time separate sessions of Board members and College members will be held for the purpose of discussing topics suggested in the address of Dean Muldoon at the 1931 meeting. Summaries of the discussions will be reported to the combined group at the Tuesday morning session by the Chairmen, and resolutions and recommendations can be discussed jointly.

Program for Faculty Group.

(*a*) What can be done to improve the quality of teaching to meet the needs of the present-day practice of pharmacy? Discussion to be led by Prof. C. P. Wimmer.

(*b*) What steps should be taken by pharmacy college faculties to keep abreast of changes in the practice of pharmacy? Discussion to be led by Prof. J. L. Dandreau.

(*c*) Are "comprehensive examinations" to be preferred in determining the qualifications of students for graduation from the four-year course? Discussion to be led by Prof. J. W. Sturmer.

Program for Board Group.

(*a*) What can be done to improve the quality of testing the fitness of applicants for registration as pharmacists? Discussion to be led by Mr. J. W. Wise.

(*b*) What steps should be taken by board members to keep abreast of changes in the practice of pharmacy? Discussion to be led by Dr. R. L. Swain.

(*c*) What changes, if any, should be made in Board of Pharmacy examinations in view of the changes in educational requirements for registration with special reference to the four-year course in pharmacy. Discussion to be led by Dr. A. C. Taylor.

7:00 P.M.

Complimentary dinner to delegates as guests of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION at the Hotel Pennsylvania, entertainment to be furnished through the courtesy of the *American Druggist*. Bring the ladies. Informal.

TUESDAY MORNING SESSION—10:00 A.M.

Report of the faculty conference with recommendations presented by Dean Hugh C. Muldoon. Discussion to be led by Dr. L. L. Walton.

Report of the conference of Board members with recommendations presented by Dr. Robert P. Fischelis. Discussion to be led by Prof. Louis Saalbach.

Final report of the Committee on Pharmacy.

Final report of the Committee on Chemistry.

The place of Pharmaceutical Jurisprudence in the Pharmacy course.—Dean W. C. Anderson.

Jurisprudence in Board examinations.—Mr. Dean B. Crawford.

Discussion to be led by Prof. C. Leonard O'Connell and Mr. J. M. Woodside.

Report of the Committee on Resolutions.
Report of the Committee on Time and Place of Meeting.
Adjournment.

NEW JERSEY BOARD OF PHARMACY.

The Board of Pharmacy of the State of New Jersey will conduct written examinations in Theoretical Pharmacy, Chemistry, Materia Medica and Toxicology, and Pharmaceutical and Chemical Problems for applicants for the Registered Pharmacist Certificate on April 7 and October 20, 1932, and for applicants for the Assistant Pharmacist Certificate on April 8 and October 21, 1932. These examinations will be conducted at the State House, Trenton, New Jersey.

All applications must be completed and on file in the office of Secretary Robert P. Fischelis, Trenton, N. J., at least thirty (30) days prior to the date of the first examination taken.

TRI-STATE PHARMACEUTICAL ASSOCIATION MEETING.

Arizona, New Mexico and Western Texas will hold a joint meeting at El Paso, March 21st to 23rd. Efforts are being made to secure a large attendance from the several states. President Walter D. Adams will be one of the speakers on that occasion.

Among the Golden Anniversary celebrants of the state associations this year are the Maryland and Alabama Associations. Alabama will celebrate at Birmingham, June 14th to 16th, and Maryland at Ocean City, June 21st to 24th.

The Oklahoma Board of Pharmacy is warning Oklahoma druggists to comply with the state law requiring a registered pharmacist to be on duty at all times. Several complaints have been entered.

LEGAL AND LEGISLATIVE.

CAPPER-KELLY HEARING, ON THE CAPPER-KELLY BILL.

Senator Capper opened the hearing with a brief statement that he considered the bill a measure for protection for the small retailer and as a check to the alarming consolidation of the retailing business. Representative Kelly described price maintenance as the most important question confronting American business to-day. He said prices must be stabilized to permit fair competition and this end must effect coöperation between the manufacturer and his distributor. The bill will stop unfair competition in one area of retail business, but will not lead to monopolistic prices because there will still be competition between manufacturers, he declared. The Pennsylvania Congressman asserted that the recent report of the Federal Trade Commission on the use of loss leaders by chain stores substantiates every argument for the Capper-Kelly bill that has been made in the last ten years and proves that every price-cutter is also a profiteer.

Witnesses included Samuel C. Henry, *secretary* of the National Association of Retail Druggists; W. Bruce Philip, Washington counsel of the N. A. R. D.; E. F. Kelly, *secretary* of the AMERICAN PHARMACEUTICAL ASSOCIATION; Samuel L. Hilton, *chairman* of the Legislative Committee of the A. PH. A.; Eugene C. Brokmeyer, counsel of the Federal Wholesale Druggists' Association. Robert L. Swain, deputy food and drug commissioner of Maryland; Samuel Y. Harris, representing the Baltimore Retail Druggists' Association; H. H. Robinson, of the Henry B. Gilpin Company, Baltimore drug wholesaler; Julius H. Riemenschneider, N. A. R. D.; Harry H. Miller, New York Pharmaceutical Conference; and William H. Wiseman, the Armand Company.

The principal questions asked by the committee had to do with quantity discounts, permitted by the bill. Several senators, including the chairman, James Couzens, of Michigan, intimated that this would still give chains a large advantage over independents and perhaps should be eliminated, while some suggested that retail customers should also be permitted quantity discounts. Most of the witnesses gave non-committal answers on this point, although some suggested that coöperative buying by retailers would meet the situation. Mr. Brokmeyer answered that this provision is simply a continuation of the language of the Clayton antitrust act, and that if it is wrong in the Capper-Kelley Bill it is wrong in the anti-trust law. Mr. Swain opposed the quantity discount unequivocally, declaring it an unfair advantage and un-American.

WASHINGTON MEETING OF THE NATIONAL DRUG SURVEY COMMITTEE.

A meeting of the National Drug Survey Committee was held in the Department of Commerce on January 26th; Robert L. Lund presided. He outlined the work of the survey and its purpose and was followed by Wroe Alderson, Field Director of the Survey. Fred N. Feiker, Director of the Bureau of Foreign and Domestic Commerce, explained phases of the survey and the progress made by the department officials was outlined. He stated that definite conclusions about the results should be reserved until they can be presented in greater detail.

The trend of information is shown by data for one store for six months and the entire survey will cover fourteen stores for twelve months. The information will be broken down into divisions, and tables will be prepared for each department for separate commodities and for groups of commodities. Mr. Alderson, with the aid of stereopticon views, discussed store modernization, pointing out that in a number of stores an average of 10.3% of the items sold were inconveniently located; in one store the percentage was as high as 24.

The matter of calling a general conference of representatives of participating organizations on April 25th to 27th in St. Louis, was discussed and approved.

E. Fullerton Cook expressed the wish that it would be possible to bring to the Conference a simple system of accounting, to be introduced into the retail drug stores in which it would only be necessary to keep one sheet daily, which would cover all the transactions occurring during the day. He stated that if such a simple system could be worked out it would only be necessary for the druggist to have a bookkeeper come into the store once a month. He further stated that he hoped there would be one strictly professional phase in the general program because professional pharmacy is the backbone of the drug business. Various and special phases of the drug business, as brought out by the survey, were presented in detail. It was stated that 50,000 questionnaires were sent out to families in St. Louis with incomes from $1800.00 upward. The returns represented about 15% of useable replies.

Victor Sadd, of the Department of Commerce, spoke on the "Conserving of the Druggists' Capital" and brought out a number of interesting facts. For example, stores that had failed and were studied paid an average of 10.6 per cent of their net sales in rent, whereas the average rent paid by going concerns was 4.7 per cent. Out of the thirty drug stores analyzed twenty-one of the operators never made up a profit and loss statement and nine of them reported that they did not know how to determine inventory turnover.

Frank A. Delgado, of the Department of Commerce, reported on "Study of the Prescription and Professional Side of Pharmacy." This material will be placed at the disposal of the U. S. P. and N. F. Revision Committees. He detailed the number of ingredients in prescriptions, and the kind of items and the number of various ingredients that were required for prescriptions.

An illustrated talk dealing with the price of drug store arrangement was presented by Mr. Alderson. The question was brought up as to how complete the survey findings would be by April, and Mr. Lund stated that the field work would be finished and a considerable number of facts that had been developed would be presented at that time. It was also determined that a Program Committee should be appointed so as to help work out the details.

R. E. Lee Williamson suggested that immediate endeavor be made to interest all state and local retail associations, stressing the importance and value of the survey. It was decided that the following committees be appointed to assist in carrying out the various plans for the April Conference: Program Committee, Arrangement Committee, Special Finance Committee, Attendance Committee, Publicity Committee and on Classification.

It was suggested that a number of prizes be provided whereby the retail druggists would become interested to a larger extent in the survey. This question was discussed from various standpoints and it was finally decided that a Committee be appointed to investigate the advisability of such competition. More than fifty representatives of different associations and organizations and of divisions of the Government attended the meeting which was pronounced interesting and successful.

PORTLAND RETAIL DRUGGISTS ASSOCIATION.

The first joint meeting of physicians and druggists of Portland, Ore., was held February 3rd. The results were most satisfactory and it is anticipated that much constructive work will be done to bring the two groups close together on professional and legislative matters.

PROPOSED LABELING OF FOODS BY HEALTH GROUP.

UNIFORM SANITARY CODE FOR STATES ALSO PROPOSED BY COMMITTEE OF CONFERENCE ON CHILD PROTECTION.

"An amendment to the Federal Food and Drugs Act and all similar State laws is recommended by the Committee on Public Health Organization of the White House Conference on Child Health and Protection 'to define an article of food or drugs as misbranded if it is advertised' through any medium in terms which are false or misleading in any particular.

"Other recommendations include the proposal that States adopt a uniform sanitary code fixing minimum measures which may be reasonably enforced. The use of chemical preservatives should be discouraged, the Committee asserts.

"These recommendations, which appear in the report of the Committee entitled 'Public Health Organization,' are set forth in a summary treatment of a section treating 'health aspects of food control.' E. L. Bishop, M.D., Tennessee State Commissioner of Health, is chairman of the Committee. The summary of the section containing the recommendations follows:

"Federal and State drug laws should be amended so that all preparations sold under names recognized in the United States Pharmacopœia or National Formulary must conform to the standards of these authorities and no deviation under any form of labeling should be permitted.

DRUG LAW CHANGES URGED.

"Federal and State laws should be amended to include in the list of narcotic or habit-forming drugs which must be named on the label, derivatives of barbituric acid, as well as of acetanilide and the like which are already included.

"The provisions in the Federal Food and Drugs Act and those in the State acts relating to therapeutic claims of drugs should be amended so that any therapeutic or medicinal claims which are false or fradulent or misleading are illegal.

"The Federal Food and Drugs Act and all State laws should be amended to define an article of food or drugs as misbranded, if it is advertised through magazines, newspapers, placards, billboards, radio broadcasting or any other means, in terms which are false or misleading in any particular.

WOULD PROHIBIT SACCHARIN.

"A provision should be included in all food laws prohibiting the manufacture and sale of foods containing saccharin.

"A provision should be included in all food laws prohibiting the addition of caffein to beverages and other foods without a plain and conspicuous declaration of the amount added.

"In addition to the usual prohibition of artificial color which conceals inferiority of damage, there should be a supplementary requirement that added color be prohibited where its use makes an article of food appear nutritionally more valuable than it is.

"The development of modern methods of refrigeration and new processes in food manufacturing now make unnecessary the employment of chemical preservatives in foods to which such methods are applicable. From the point of view of child health the use of chemical preservatives should be discouraged, especially as control under an act of such general structure as the Federal law is extremely difficult. To enforce the provision of this law on chemical preservatives it is necessary to procure evidence that a preservative has been added in such quantities as to render the food itself deleterious to health. Under many State laws, however, objectionable preservatives specifically are prohibited regardless of the amount employed. It is recommended that where amendatory legislation is considered, the subject of chemical preservatives be given consideration and that the injunctions relating to them be specific rather than general."—From *U. S. Daily.*

"FOOD AND DRUGS ACT—ADULTERATION — MISBRANDING — STATEMENTS IN BOOKLET ENCLOSED IN CARTON.

"Statements in a booklet enclosed in the carton in which a drug was sold, which did not appear on the outside of the carton or on the bottle containing the drug, could be considered in determining whether the drug was adulterated within the meaning of the Federal Food and Drugs Act which provides (21 U. S. C. 8) that a drug shall be deemed adulterated 'if its strength or purity fall below the professed standard or quality under which it is sold;' such statements could also be considered in determining whether the drug was misbranded

within the meaning of provisions of the act (21 U. S. C. 10) that a drug shall be misbranded 'if its package or label shall bear or contain any statement' regarding the curative or therapeutic effect of the drug 'which is false and fraudulent,' but could not be considered in determining whether the drug was misbranded under other provisions of the act (al U. S. C. 9) that a drug shall be misbranded if the 'package or label shall bear any statement' regarding the drug, or the ingredients or substances contained therein; which is 'false or misleading.'—United States v. 17 Bottles, etc.; D. C. D. Md., Nos. 4666, 4667, Jan. 5, 1932.

"The Federal Government's libel to condemn misbranded drugs under the Food and Drugs Act alleging that 'false and fraudulent' statements as to the ingredients of the drug and the effect which they were capable of producing were applied to the drug 'knowingly or in reckless and wanton disregard of their truth or falsity' was sufficient, notwithstanding the failure to allege that the false statements were made with 'actual intent to deceive.'—United States v. 17 Bottles, etc.; D. C., D. Md., Nos. 4666, 4667, Jan. 5, 1932."

ADMINISTRATION LIMITS.

Under existing laws, Mr. Robb explains, "the jurisdiction of the Food and Drug Administration of the Department of Agriculture, in enforcing the Food and Drugs Act, is restricted to the package itself, but claims made in newspapers, magazines and other collateral advertising are considered by the Government and the courts in fraud order proceedings under the postal laws, and such claims outside the package also are censored by the Federal Trade Commission.

"The present situation with respect to the powers of the Federal Trade Commission over collateral advertising is this: The Supreme Court, while ruling that the Commission is properly concerned with 'protecting the public against dangerously misleading advertisements of the remedy sold in interstate commerce,' apparently has so construed the statutes creating the Commission and defining its powers and duties as to impose a heavy handicap upon the commission in establishing the facts essential to the jurisdiction of the Commission in any case.

"There are substantial reasons for believing that Congress will decide to amend the Food and Drugs Act again, rather than attempt to make the Federal Trade Commission Act expressly embrace the unfair advertising of drugs and medicines outside the package. It should be remembered that in legislating regarding the Commission, Congress must rely upon the commerce clause of the Constitution, with its limitations and qualifications respecting commerce and competition, while Congress enjoys rather elastic powers when enacting laws that are subject to classification as welfare or health measures, such as pertain to foods and drugs, under the reserve or police powers of the national government.

"Aside from these purely legal considerations in this question, for careful consideration not only by Congress but by all those who manufacture and sell drugs and medicines. Would it be more satisfactory to have the censorship of all claims and representations in the hands of one agency of the Government—the Food and Drug Administration—or to have such censorship apportioned or divided between the Food and Drug Administration and the Federal Trade Commission, the one dealing with package claims and the other with all collateral advertising outside the package?"—*Drug Trade News.*

PHILADELPHIA DRUG EXCHANGE.

All officers of the Philadelphia Exchange were reëlected for 1932, these including: *President*, John F. Belsterling; *Vice-President*, Harrison S. Hires; *Secretary*, Joseph W. England; and *Treasurer*, F. L. Bodman. The board of directors elected consists of J. Mervin Rosenberger, Benjamin S. Thorp, H. K. Hineline, H. H. Whyte, Herbert R. McIlvaine, Walter V. Smith, Alexander C. Fergusson, Jr., and E. L. Brendlinger.

In his annual message, President Belsterling stated that under the conditions of the depression of 1931, the prices of all commodities naturally registered the lowest levels over a period of a number of years past. The drug and chemical business, like all other business, he said, has felt this depression, but not to such a great extent as many, although the chemical industry has been affected to a greater extent than the drug, proprietary and regular jobbing business. It would be idle to prophesy conditions for 1932, he continued, but he believed that the crisis of business depression had been reached and passed, and that from now on there will be a slow and steady convalescence of sick-business until recovery results.

The annual dinner of the Philadelphia Drug Exchange was held January 28th in the Clover Room of the Bellevue-Stratford Hotel, Philadelphia. Leading men in the drug, chemical and allied industries of Philadelphia were present, providing an opportunity for discussion of important topics and for social activities. A reception preceded the dinner.

Addresses were made by Mayor J. Hampton Moore, of Philadelphia; Dr. William A. Pearson, president of the Philadelphia Rotary Club and dean of the Hahnemann Medical College, whose subject was "Personality;" and by Professor John Dennis Mahoney, head of the English department of the West Philadelphia High School.

COURT RULING STATES "ANTISEPTIC" NO DRUG LAW STANDARD.

Judge Chestnut of the U. S. District Court for the District of Maryland, rejected the government's charges that a preparation is adulterated and that it is misbranded because false and misleading statements appear in the circular accompanying it, but ruled that the case must go to trial on charges of false and fraudulent statements in the booklet surrounding each bottle. The Judge declared that the word "antiseptic" does not of itself convey the idea of any particular strength or degree, pointing out that it is not the equivalent of germicide and that it was in use prior to the discovery of bacteriological activity. He held that to say a substance is antiseptic is merely to affirm that it has a tendency to prevent putrefaction, decay or the development or increase of bacteria and does not indicate a part potency. The decision was rendered on "B. & M.," an external remedy described as useful in treating a number of internal diseases.

RELATION OF BACTERIOLOGY TO PHARMACY.

Sir William Willcox, M.D., in addressing the Pharmaceutical Society on above subject, said in part:

"It is necessary if bacteriology is taught to pharmacists that it should be taught not in an academic way; you do not need to learn what microbes there are in the soil at every foot depth, and all those forms of bacteria which have an academic interest. You want to know what is the importance of bacteriology as it applies to your work, to therapeutics. I think it is advisable that the teaching of bacteriology should be carried out not by a botanist who knows a great deal about the subject academically, or by anyone else who has devoted his time to the academic side, but by someone who has practical knowledge of the therapeutic side; in other words, it should be carried out by some bacteriologist who has a medical qualification, and, something more than that, who knows something about therapeutics and the application of bacteriology to pharmacy.

"I am anxious that pharmacy should be a profession which is not lagging behind therapeutics and modern medicine. The pharmacist is the person who knows best about how these remedies should be prepared, and understands their chemical constitution, compatibility and incompatibility, and so on, and it is a very little step for him to make himself master of the simple principles of bacteriology on which sterilization is based."

PHARMACEUTICAL SERVICE IN THE BRITISH ARMY.

According to the report made to the International Pharmaceutical Federation there is no separate Pharmaceutical Service in the British Army. The chemicals, pharmaceutical products and surgical dressings required are purchased from civilian manufacturers. The purchasing and inspection of these supplies is carried out by several civilian pharmacists in the Contracts Branch at War Office.

"During the late War this system of Pharmaceutical Service was found to be sadly lacking in efficiency. Civilian pharmacists were hurriedly recruited and through faulty organization were frequently not given work which utilized their skill. Much wastage of man power and material resulted.

"The Pharmaceutical Society of Great Britain through the League of Ex-Service Pharmacists has for several years used strenuous endeavors to convince the War Office of the necessity for an adequate Pharmaceutical Service in the British Army."

The degree of M.A. in economics and accounting was conferred upon Chief Pharmacist Abraham T. Schwartz, U. S. Navy, at the February 1932 convocation of George Washington University. He has served in the Navy for twenty-seven years and now is on duty in the bureau of medicine and surgery, in charge of the division of vital statistics. He was graduated in pharmacy and is a registered pharmacist in the states of Massachusetts, New York and in the District of Columbia. In 1925 he received his B.S. in biology at New York University.

Secretary Herbert C. Kassner has contributed an informative message to the *American Druggist* for February, in which he writes of the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION. This coöperation is of a worth-while type, because it is informative and should make pharmacists think of their opportunities to bring pharmacy to its proper place among the professions. *The American Druggist* is sharing largely in these coöperative efforts.

ADDITIONAL NEWS ITEMS.

Dean Charles F. Heebner, of the Ontario College of Pharmacy, has been elected Second Vice-Principal of the Principals' Association of Toronto.

Dr. I. M. Kolthoff has been on a lecture trip this month, speaking on "The Theory of Coprecipitation." He spoke at Oberlin College, Yale University, Princeton University, and American Chemical Society Sections at Cleveland, State College, Pennsylvania and the Pittsburgh Section.

Dean C. E. Mollett, who is attending the University of Florida, met with a painful accident, the result of a fall.

We are in receipt of two reprints of articles by **Alfredo C. Santos,** Assistant Professor of Pharmaceutical Chemistry, School of Pharmacy, University of the Philippines: "Alkaloids of Phaeanthers Ebracteolcitus (Presl.) Merrill." "On Phaeanthine (First Communication); Chemical and Pharmacological Studies of Plumierid."

Vice-President Elect Rowland Jones has called our attention to an error in a statement "that he holds a degree from the College of Pharmacy of the University of Wisconsin." He attended three years at the University in the course in Letters and Science. Mr. Jones is not only Vice-President Elect of the AMERICAN PHARMACEUTICAL ASSOCIATION, but he also is *chairman* of the Section on Commercial Interests.

Dean John R. Minehart, wife and daughter are spending some time in Porto Rico. Dr. Minehart has made the trip hoping that he will regain his health. The dean has a number of friends among pharmacists in Porto Rico and a visit with them will add to his enjoyment.

Dr. James C. Munch was recently called by a train-plane to Fresno, Calif., to aid in the treatment of about forty Mexicans who were taken ill from eating thallium-poisoned tortillas. Dr. Munch is an authority on thallium-poisoning and consulting pharmacologist of the U. S. Department of Agriculture; also, director of the Pharmacological Laboratories for Sharp & Dohme.

Secretary J. Lester Hayman issues very interesting bulletins to the members of West Virginia Pharmaceutical Association. The last bulletin was artistic and timely, as it related to the George Washington Bicentennial celebration.

Veteran E. B. Heimstreet was a speaker at the last meeting of the Milwaukee Veteran Druggists Association.

Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists.—Third edition, compiled by the Committee on Editing Methods of Analysis, W. W. Skinner, chairman. This edition has been revised to include the editions, deletions and other changes made since 1925. About 100 pages of new material and tables have been added and new chapters on caustic poisons, naval stores, paints, radio activity, etc., have been added.

An index includes the new definitions for fertilizers that have been finally approved by the Association. All the methods included in this book are accredited by the Secretary of Agriculture in law enforcement work and are also accepted by the states in regulatory activities.

The volume has nearly six hundred pages, including the index, and may be purchased from the Association of Official Agricultural Chemists, Postoffice Box 290, Pennsylvania Avenue Station, Washington, D. C. The book is divided into 42 chapters and contains 38 illustrations.

Drug Contact Committee Recommends Tolerances and Analytical Methods.—Recommendations for tolerances and analytical methods for a number of tablets and ampuls appear in the ninth report of the Combined Contact Committee of the American Drug Manufacturers Association and the American Pharmaceutical Manufacturers Association, recently submitted to the Federal Food and Drug Administration. The report also contains recommendations relating to the quantity of contents of ampuls.

Free copies may be obtained by writing the Food and Drug Administration, U. S. Department of Agriculture, Washington, D. C.

Town and Country Life, of London, depicts Dean Frederick J. Wulling as an outstanding pharmacologist.—The biographical sketch is accompanied by a portrait.

Ergot and Ergotism (1931): A Monograph Based on the Dohme Lectures Delivered in Johns Hopkins University, Baltimore. By GEORGE BARGER, F.R.S., Professor of Chemistry in Relation to Medicine in the University of Edinburgh.—Publishers: Gurney and Jackson, London: 33 Paternoster Row, E. C. Edinburgh: Tweeddale Court.

Professor Barger has very successfully devoted much of his time during over a quarter of a century to intensive researches on Ergot. To this distinguished scientist we are indebted for much of our present knowledge of this drug, particularly with respect to the chemical constituents, both active and inactive. These successful chemical researches made possible very fruitful and significant pharmacological researches, in which Professor Barger worked in collaboration with the renowned pharmacologist, Dr. H. H. Dale, furnishing the basis of the great amount of work of others which followed. It is highly improbable, therefore, that a monograph of Ergot could have come from a more competent authority, because of his intimate studies on Ergot from the time of the infection of the host plant by the fungus, to the actual clinical observations on the activity of constituents and pharmaceutical preparations of the drug.

This book covers the entire subject of Ergot more thoroughly and more accurately than any that has appeared to date. A total of 279 pages includes 41 illustrations, a most complete and accurate bibliography of 44 pages, and a subject and author index.

The subject matter is divided into six chapters, as follows: I. Ergot—Historical; II. Ergotism; III. Botanical; IV. Chemical; V. Pharmacological and Clinical; VI. Pharmaceutical and Forensic. In treating on the subject, all important phases are dealt with as thoroughly as present knowledge permits, in a thoroughly scientific, though clear and readable, manner. It is an exceptionally valuable and timely contribution to sciences of Pharmacy and Medicine.

Professor Barger has appropriately dedicated this book to the memory of Dr. Charles Tanret (1847–1917), the first to isolate an alkaloid from Ergot in a pure, crystalline condition.—MARVIN R. THOMPSON.[1]

Chemical Reference Works in Indianapolis.—A committee appointed by the Indiana Section of the American Chemical Society has compiled and published in a 35-page booklet data concerning the most important chemical literature available in Indianapolis libraries. Eight libraries coöperated with the committee in compiling lists and granting members of the section the privilege of using works of reference in the libraries. The booklet devotes 22 pages to listing chemical journals, indicating abbreviations by capital letters as in *Chemical Abstracts*, and by means of key letters the number and date of the first and last available volumes and the library in which each is made available. Then follow 9 pages listing chemical books, including A. C. S. monographs, government publications, pharmacopœias of various nations and experiment station bulletins.

[1] Emerson Professor of Pharmacology, School of Pharmacy, University of Maryland.

DRUG-CHEMICAL DINNER.

Plans are being formulated for the Drug-Chemical Dinner to be held at the Hotel Commodore in New York City on March 15th. Chairman Percy C. Magnus expressed himself as much encouraged relative to the dinner. The reservations up to this time are largely in excess of those of last year, and representatives will be in attendance from Boston, Philadelphia, Chicago, Indianapolis, Baltimore, Atlanta and other commercial centers. It is said that the dinner will be of great importance and deserves national recognition, being a leading event in the allied industries.

OUABAIN IN HEART DISEASE.

In *The Prescriber* (Edinburgh), September 1931, Dr. E. Podolsky, of Brooklyn, N. Y., summarizes the therapeutic value of ouabain in heart disease. Ouabain is chemically and physically identical with the crystalline principle obtained from the *Strophanthus glab.*

Ouabain is particularly valuable and preferable to digitalis whenever cardiac insufficiency is associated with the loss of myocardial tone; digitalis has very little influence on myocardial tonus.

Ouabain does not and cannot take the place of digitalis. The two drugs have essentially different actions. Digitalis, by its moderating action on the excitability and conductibility of the heart, regulates cardiac rhythm; whereas ouabain improves myocardial tonus. From this point of view, ouabain supplements the action of digitalis, the two substances constituting, by their judicious successive employment, a particularly valuable therapeutic complex. Some clinicians assert that they can very well be administered at the same time.—From—*Current Medical Literature.*